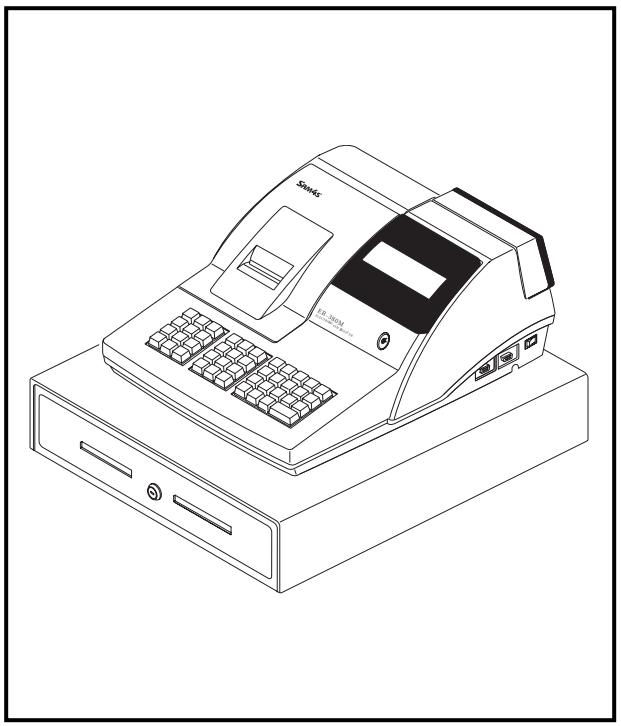
SAM4S

ELECTRONIC CASH REGISTER

ER-380M / ER-380F / ER-380RK

SERVICE Manual

ELECTRONIC CASH REGISTER



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About this Manual

This service manual describes how to perform hardware service maintenance for the SAM4S ER-380M/F Series Electronic Cash Register.

Notes

Notes may appear anywhere in the manual. They describe additional information about the item.

Precaution symbols

⚠. Indicates a Safety Precaution that applies to this part component.

⚠. Indicates the part or component is an electro-statically sensitive device. Use caution when handling these parts.

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SAM4S ER-380M/F SERIES

Service Manual First edition.

JAN 2004.

V1.0

Printed in KOREA

Overview of this ECR

This ECR is a microprocessor-based system, using a 16 bits microprocessor .

This service manual provides the technical information for many individual component systems, circuits and gives an analysis of the operations performed by the circuits. If you need more technical information, please contact our service branch or R&D center. Schematics and specifications provide the needed information for the accurate troubleshooting.

All information in this manual is subject to change without prior notice. Therefore, you must check the correspondence of your manual with your machine. No part of this manual may be copied or reproduced in any form or by any means, without the prior written consent of Shin Heung Precision .

Note: Before using this Electronic Cash Register (SECR) for the first time, leave it powered on in the REG mode for at least twenty-four hours. This allows the Ni-MH battery, which maintains the memory of the ECR while the power is off, to charge completely.

"Proper disposed of batteries is required. Refer to your local codes for disposed requirements."

1 Precaution Statements

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.

1-1 Safety Precautions

1. Be sure that all built-in protective devices are replaced. Restore any missing protective shields.
2. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including nonmetallic control knobs and compartment covers.
3. Make sure there are no cabinet openings through which people - particularly children - might insert fingers and contact dangerous voltages.
   Such openings include excessively wide cabinet ventilation slots and improperly fitted covers and drawers.
4. Design Alteration Warning:
   Never alter or add to the mechanical or electrical design of the SECR. Unauthorized alterations might create a safety hazard. Also, any design changes or additions will void the manufacturer's warranty.
5. Components, parts and wiring that appear to have overheated or that are otherwise damaged should be replaced with parts that meet the original specifications. Always determine the cause of damage or over- heating, and correct any potential hazards.
6. Observe the original lead dress, especially near the following areas : sharp edges, and especially the AC and high voltage supplies.
   Always inspect for pinched, out-of-place, or frayed wiring. Do not change the spacing between components and the printed circuit board. Check the AC power cord for damage. Make sure that leads and components do not touch thermally hot parts.
7. Product Safety Notice:
   Some electrical and mechanical parts have special safety-related characteristics which might not be obvious from visual inspection.
   These safety features and the protection they give might be lost if the replacement component differs from the original - even if the replacement is rated for higher voltage, wattage, etc.

   Components that are critical for safety are indicated in the circuit diagram by shading, (⚠) or (⚠). Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.

Dispose used batteries according to the manufacturer's instructions.

ATTENTION

ll y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.

Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

1-2 Servicing Precautions

WARNING: First read the-Safety Precautions-section of this manual. If some unforeseen circumstance creates a conflict between the servicing and safety precautions, always follow the safety precautions.

WARNING: An electrolytic capacitor installed with the wrong polarity might explode.

1. Servicing precautions are printed on the cabinet. Follow them.
2. Always unplug the units AC power cord from the AC power source before attempting to:
   (a) Remove or reinstall any component or assembly
   (b) Disconnect an electrical plug or connector
   (c) Connect a test component in parallel with an electrolytic capacitor
3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the portion around the serviced part has not been damaged.
5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples : metal panels and input terminals).
6. Insulation Checking Procedure:
   Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500V) to the blades of AC plug.
   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
7. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
8. Always connect an instrument's ground lead to the instrument chassis ground before connecting the positive lead ; always remove the instrument's ground lead last.

1-3 Precautions for Electrostatic Sensitive Devices (ESDs)

1. Some semiconductor (solid state) devices are easily damaged by static electricity. Such components are called Electrostatic Sensitive Devices (ESDs); examples include integrated circuits and some field-effect transistors. The following techniques will reduce the occurrence of component damage caused by static electricity.
2. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. (Be sure to remove it prior to applying power - this is an electric shock precaution.)
3. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of electrostatic charge.
4. Do not use freon-propelled chemicals. These can generate electrical charges that damage ESDs.
5. Use only a grounded-tip soldering iron when soldering or unsoldering ESDs.
6. Use only an anti-static solder removal device. Many solder removal devices are not rated as anti-static; these can accumulate sufficient electrical charge to damage ESDs.
7. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
8. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
9. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting a foot from a carpeted floor can generate enough static electricity to damage an ESD.

2 Product Specifications

Specifications are correct at the time of printing. Product specifications are subject to change without notice.
See below for product specifications.

2-1 General Specifications

Item	Description	Remark
Processor	• MITSUBISHI M16C/80 Group M30800SFP (16 Bit)	External ROM Version
Memory	• RAM SRAM (K6T1008C2E) : 1MBITs or 2MBITs SRAM (K6T4008C2E) : 4MBITs × 1EA(Option) • ROM EPROM: 4MBITs (M27C4001)	
Battery	• Type : Ni-MH, 3.6V 70mAh • Charging Time : 24 Hours • Life : 2 Years	External Battery
Data Storage	• 60 Days	When battery is Full charged
Interface Serial (RS-232C)	• Flow Control : ① DTR / DSR : H/W Flow Control ② XON / XOFF : S/W Flow Control • Baud Rate : 1200 / 2400 / 4800 / 9600 / 19200 Bps • Connector : DB9P Female (I/F PBA) • Voltage Supply : VCC(+5V/200mA) supplies at 9Pin of Connector.	RS-232C #1 RS-232C #2
Printer	• Model : Shin-Heung STM-210 • Printing Speed : 50 mm / Sec (13.3 Line / Sec) • Paper Dimension : 57.5mm± 0.5mm x 70mm Thermal Paper	Detail Spec refer to Next Page
Display	• Operator Display : 16*2 Character LCD(ER-380M) • Operator Display :10 Digits VFD(ER-380F) • Customer Display : 10 Digits VFD	
Key Board	• Raised Key : 44 key	
Power Consumption	• Approx. 25W (Regularity)	
Power Requirement	• AC 120V 60Hz, 230V 50Hz	
Environment Condition	• Temperature : 0℃ ~ 45℃ • humidity : 30% ~ 80% RH	
Dimensions(mm)	400(W) x 450(D) x 266(H)	

Table2-1 General Specifications

2-2 Appearance

2-2-1 Appearance Dimensions (mm)

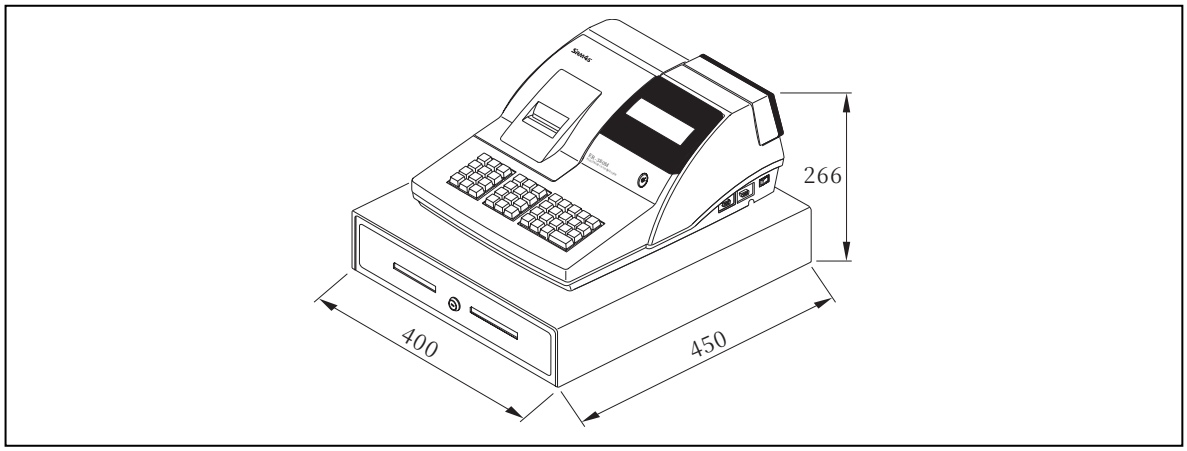


Figure2-1 Dimensions

2-2-2 Feature Locations

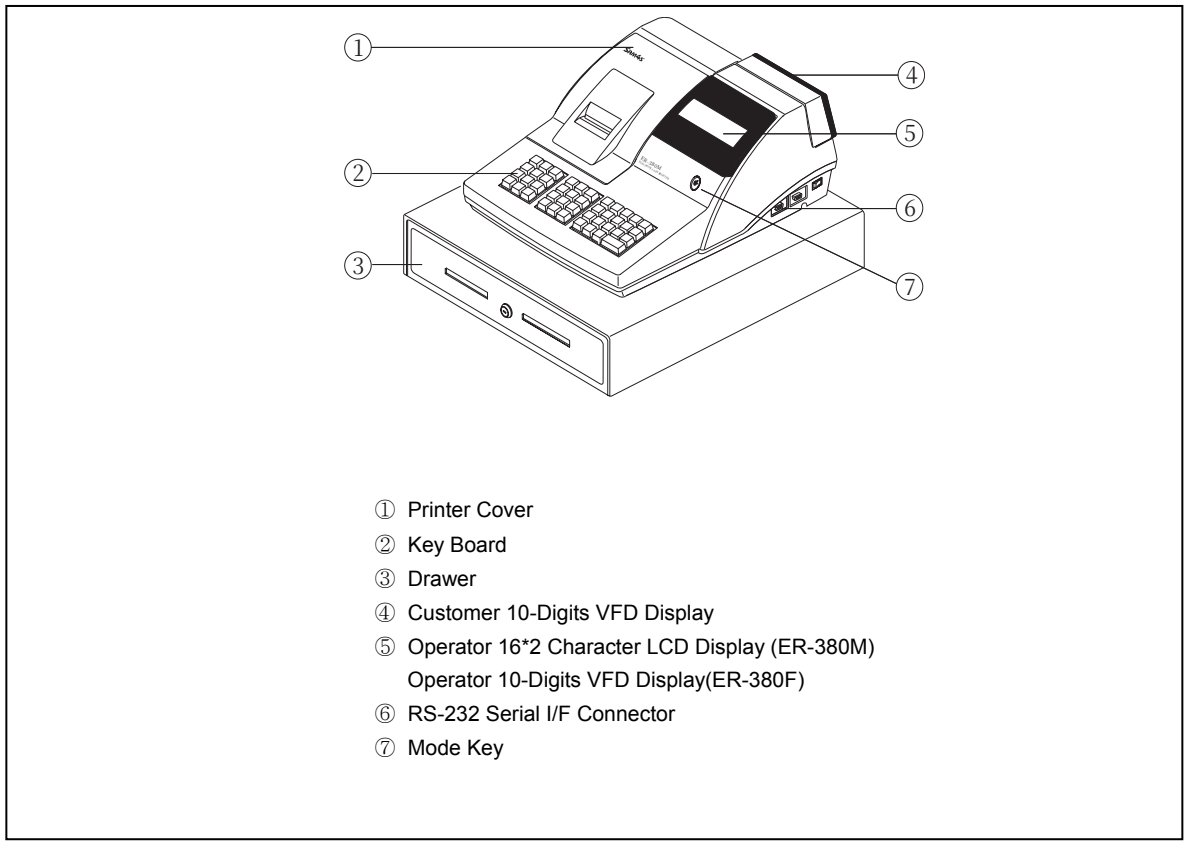


Figure2-2 Location Features

2-3 Thermal Printer Specifications

2-3-1 Printer Specification

Item		Description	Remark
Model		• STM-210	Shin Heung Precision
Print Method		• Thermal Line Printing	
Printing Format	Total Number of Dots	• 384 Dots / I Line	
	Dot Pitch	• Vertical : 0.125 mm • Horizontal : 0.125 mm	
Printing Speed		• 50 mm/Sec (At 8.5V of Motor Voltage)	
Printing Direction		• Unidirectional friction feed	
Paper Feeding	Feeding Method	• Friction Feed	
	Minimum Feed Pitch	• 0.0625 mm	
	Feeding Speed	• 50 mm/Sec (At 8.5V of Motor Voltage)	
Power Supply Volt	Power Voltage	• 8V / 8.5V (Recommend)	Head/Motor
	Circuit Input Voltage	• 5V	Head Control/Sensor
Printer Head	Heat Element Density	• 8 Dots/mm (0.125 mm/Dot)	
	Total Head Elements	• 384 Dots/Dot Line	
	Available Printing Width	• 48 mm	
	Heat Element Typical Ω	• 176 Ω ±4%	
Line Feed Motor		• 4-Phase Bi-Polar Stepping Motor	
Sensor	Head Temperature	• Thermistor	
	Paper-End Sensor	• Reflecting Photo Sensor	
	Printer Cover Open Sensor	• Micro Switch	
Reliability	Life	• 15,000,000 Lines	
	MCBF	• 37,000,000 Lines	
Dimension (mm)		• 82.5 (W) ×147.3 (D) ×101.4 (H)	
Weight		• Approx. 365 g	

Table2-2 Thermal Printer Specifications

2-3 Thermal Printer Specifications

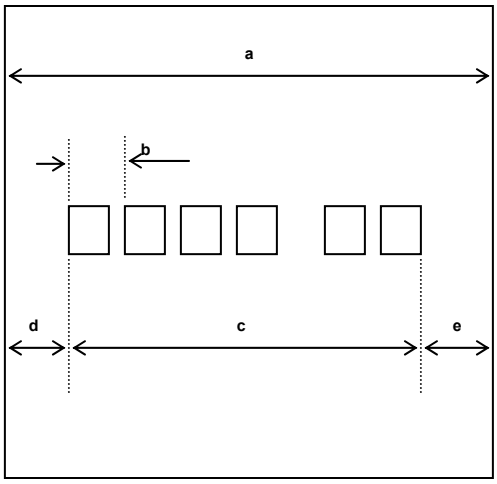
2-3-2 Paper Specification

Item	Description	Remark
Paper Type	• Single-ply Thermal Paper Roll	
Paper Size	• 57.5 mm ± 0.5 mm (Width) × 70 mm or less	

Table2-3 Paper Specifications

2-3-3 Printable Area

The Printable area of a paper with width of 57.5mm is 48mm(384 dots) and the space on the right and left sides are approximately 4.75mm.



a = 57.5±0.5 mm (Paper Width)
b = 0.125 mm (1 Dot)
c = 48 mm (384 Dots/Printable Area)
d = 4.75 mm (Left Space)
e = 4.75 mm (Right Space)

Figure2-3 Printable Area

2-3-4 Character Specification

Item	Description	Remark
Character Structure	• 12(W) × 24(H) Font (Including a horizontal)	
Character Size	• 1.25 mm(W) ×3.0 mm(H)	
Column Pitch	• 1.5 mm	
Line Pitch	• 3.75 mm (Including 6-dot line spacing)	
Number of Column	• 32 (12×24 Dots/Character)	

Table2-4 Character Specification

2-3 Thermal Printer Specifications

2-3-5 Other Component Specification

Item		Description	Remark
Paper Feed Motor	Part Name	• SP-15RF-015K	Moatech Co., Ltd.
	Type	• 4-Phase 20 Step PM Stepping Motor	
	Power Supply Voltage	• 4.5V ~8.5V DC	
	Resistance	• 20 Ω ±7% (25℃/Phase)	
	Current Consumption	• Approx. 425 mA	
	Drive Method	• Constant-Voltage Driving using 2-2 Phase Excitation	
TPH	Part Name	• KF2002-GF94C	ROHM
	Number of Heat Element	• 384 Dots	
	Heat Element Density	• 8 Dots/mm (0.125 mm/Dot)	
	Typical Resistance Value	• 176 Ω ±4%	
	Current	• Approx. 5 A (Peak)	
Thermistor	Constant B	• 3950K ±2%	
	Resistance Value	• 30 kΩ ±5% (25℃)	
	Temperature Character	• Rt=R(25)×Exp[B×{1/(T+273)-1/(25+273)}]	
	Operating Temperature	• -20℃ ~ 80℃	
Paper End Sensor	Type	• Reflecting Photo Sensor	
	Spec	• SG-2BC (KODENSHI corp.)	
Cover Open Sensor	Detect Method	• On when the printer head is load.	

Table2-5 Other Component Specifications

2-3 Thermal Printer Specifications

2-3-6 Printer Connector

Pin No.	Signal Description	Remark
1	Lever Sensor	CN8
2	GND	

Table2-6 Printer Cover Open Switch Pin Assignment

Pin No.	Signal Description	Remark
1	Phase B	CN3
2	Phase B-	
3	Phase A	
4	Phase A-	

Table2-7 Printer Line Feed (Paper Feed) Motor Pin Assignment

Pin No.	Signal Description	Remark
1	Paper End Sensor LED Current Limit Signal	CN4
2	Paper End Sensor Input Signal	
3	VCC	

Table2-8 Printer Paper End Sensor Pin Assignment

2-3 Thermal Printer Specifications

Pin No.	Signal Description		Remark
1	VH	(+8.5V)	
2	VH	(+8.5V)	
3	DO	(Serial Data Output)	N.C
4	/LAT	(nLATCH)	
5	GND		
6	GND		
7	STB1	(nSTROBE#1)	Short on Print PCB
8	STB2	(nSTROBE#2)	
9	STB3	(nSTROBE#3)	
10	TM	(Thermistor)	
11	TM	(Thermistor)	
12	VCC	(+5V)	
13	STB4	(nSTROBE#4)	Short on Print PCB
14	STB5	(nSTROBE#5)	
15	STB6	(nSTROBE#6)	
16	GND		
17	GND		
18	CLK	(Serial Clock)	
19	DI	(Serial Data Input)	
10	VH	(+8.5V)	
21	VH	(+8.5V)	

Table2-9 Thermal Head Pin Assignment

2-4 Power Specifications

2-4-1 Power Specification

Item	Description	Remark
Input Voltage & Current	• U.S.A : AC 120V, 60Hz,0.3A (Min : 102V, Max : 138V) • Europe : AC 230V, 50Hz,0.16A (Min : 195.5V, Max : 264.5V)	Max & Min : ±15%
Power Consumption	• Operating : 25W	
Output Voltage	• AC 19V 2.3A (Wire Color : Blue-Blue) • AC 24V 0.15A (Wire Color : Red-Red)	Power Transformer Output

Table2-10 Power Specifications

2-5 Interface Specifications

2-5-1 RS-232C Serial Interface

2-5-1-(a) Specification

Item	Description	Remark
Data Transmission	• Serial	
Synchronization	• Asynchronous	
Hand Shaking (Flow Control)	• H/W : DTR / DSR • S/W : XON / XOFF	XON : ASC Code 11h XOFF : ASC Code 13h
Signal Level	• Logic"1" (MARK) : -3V ~ -15V • Logic"0" (SPACE) : +3V ~ +15V	
Baud Rate	• 1200 / 2400 / 4800 / 9600 / 19200 bps	
Data Word Length	• 7 Bit / 8 Bit	
Parity	• None / Even / Odd	
Connector	• DB9P Female	
Voltage Supply	• VCC(+5V/200mA) is supplied at 9Pin of D-SUB Connector.	For Bar Code Reader or other devices

Table2-11 RS-232C Specification

2-5-1-(b) RS-232C I/F Cable

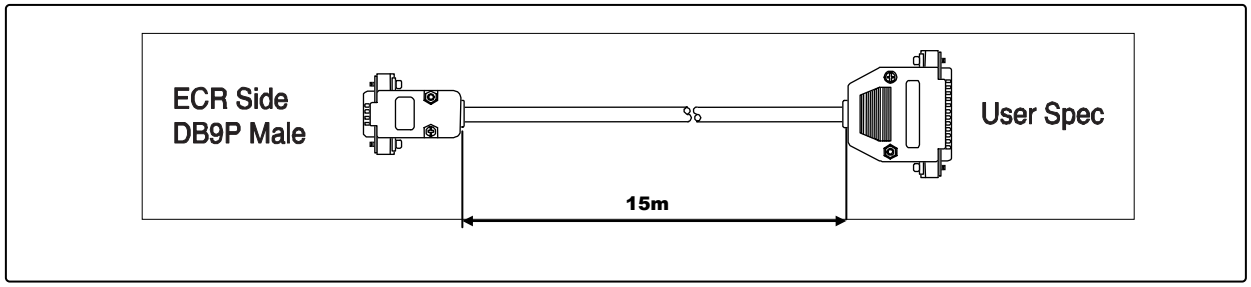


Figure2-4 RS-232C Cable

2-5-1-(c) Cable Connection

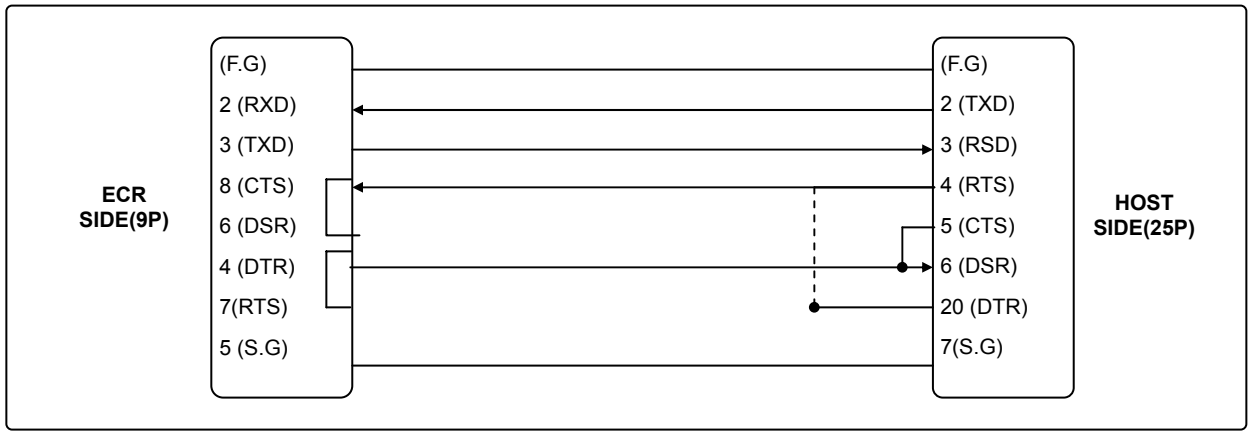


Figure2-5 RS232C Cable Connection

2-5 Interface Specifications

2-5-1 RS-232C Serial Interface

2-5-1-(d) Signal Description

Pin No.	Signal Name	Signal Direction	Function
BODY	Frame GND	-	Frame Ground
2	RXD	Input	Receive Data
3	TXD	Output	Transmit Data
4	DTR	Output	This Signal indicates whether the ECR(ER-380) is busy. (H/W flow control) ① MARK(Logic1) : The ECR is busy ② SPACE(Logic0) : The ECR is not busy ③ The host transmits a data to the ECR, after confirming this signal. ④ When XON/XOFF flow control is selected, the host does not check this signal.
5	Signal GND	-	Signal Ground
6	DSR	Input	This signal indicates whether the host computer or receipt printer can receive data. (H/W flow control) ① MARK(Logic1) : The host can receive a data. ② SPACE(Logic0) : The host can not receive a data ③ The ECR transmits a data to the host or receipt printer, after confirming this signal. ④ When XON/XOFF flow control is selected, the printer does not check this signal.
9	VCC	Output	VCC(+5V/200mA) is supplied at 9Pin of D-SUB Connector.

Table2-12 RS-232C Signal Description

Caution: The VCC is supplied for the barcode or device power source. The Supply Current 200mA is total value including COM1 and COM2 Power Consumption. If the Total Power Consumption of the attached devices is exceeded the specification(200mA), the system stops the VCC of D-SUB Connector

Caution: If the device with 5V/200mA is connected to COM1, the VCC of COM2 can not use. If the device with 5V/200mA is connected to COM1, Other device with 5V/200mA can be connected to COM2 Port.

2-5-1-(e) H/W Flow Control Timing

When DTR/DSR flow control is select, before transmitting a data, the ECR checks whether the host is BUSY or not. If the host is BUSY, ECR does not transmit a data to the host. If the host is not BUSY, ECR transmits a data to the Host. The host is the same. Refer to the Interface Part of Chapter 7(Special Circuit Diagrams).

2-5-1-(f) S/W Flow Control Timing

When XON/XOFF flow control is selected, the ECR transmits XON(ASCII 11h) or XOFF(ACSII 13h) signal through the Serial Data Line. If the ECR is busy, the printer transmits XOFF(ASCII 13h) to host through the Serial Data Line. Then the host recognizes that the ECR is busy. So, the host does not transmit a data to the ECR. If the ECR is released from busy, the ECR transmits XON(ASCII 11h) to host through the Serial Data Line. Then the host recognizes that the ECR is not busy. And the host transmits a data to the ECR.

2-5 Interface Specifications

2-5-2 EKLZ Interface

2-5-2-(a) Cable Connection

CN9			EKLZ	
Signal	**Pin No**	**Wire Color**	**Pin No**	**Signal**
VCC	1	RED	6	VCC
TXD	2	YELLOW	3	RXD
RXD	3	GREEN	1	TXD
-	4	-	-	-
GND	5	BLACK	7	GND

Table2-13 EKLZ Cable Connection

2-5-2-(b) I/F Cable

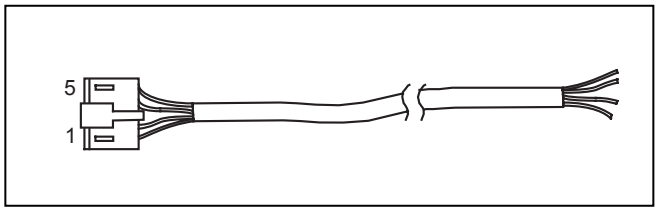


Figure2-6 I/F Cable

MEMO

3 Installation and Operation

3-1 System Configuration

3-1-1 Configuration

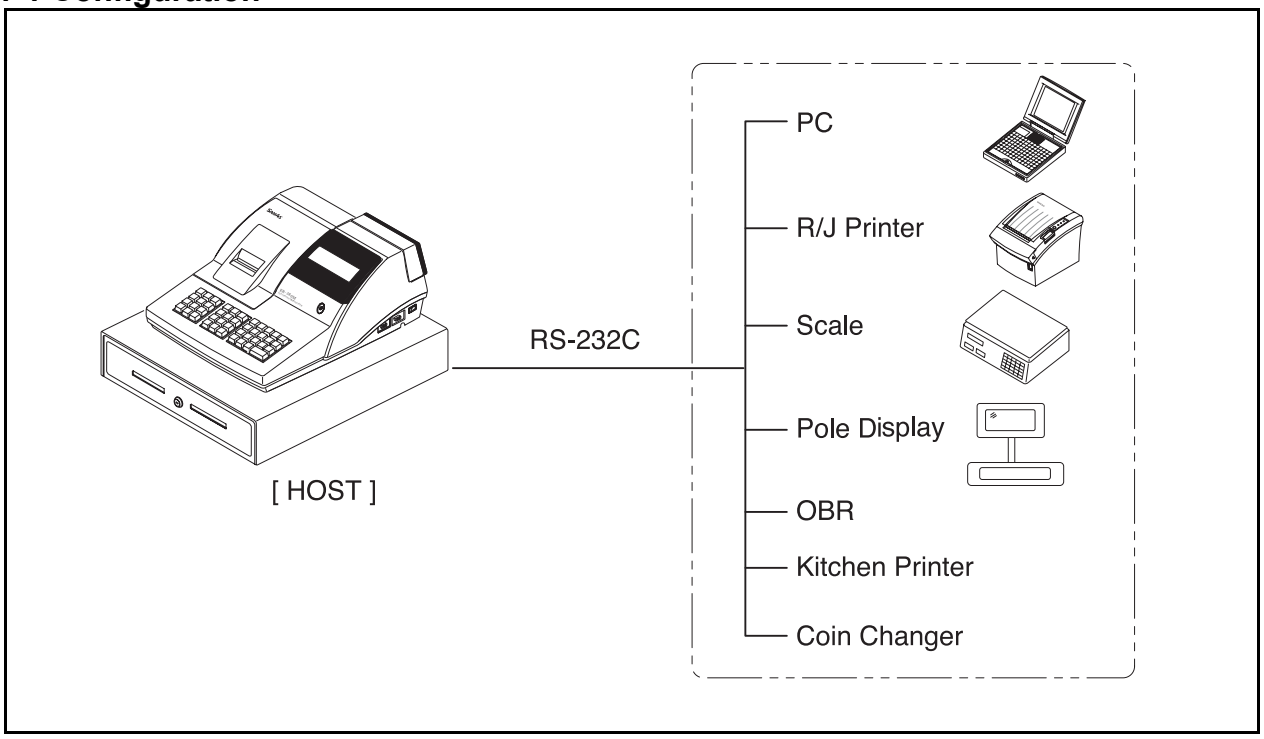


Figure 3-1 System Configuration

3-2 Installation

3-2-1 Paper Roll Installation

1. Open the Cover Printer.
2. Push the Blue Cap Lever towards the rear of the printer and lift up to open the Pinter Cover.
3. Ensure that the paper is being fed from the bottom of the roll. Place the roll into the concave bottom of the Printer. And put the leading edge of the paper over the Printer.
4. Close the Printer cover slowly until it locks firmly.
5. Tear off the excess paper.

3-2-2 Take-Up Spool Installation

1. Before using the Printer. Install the Take-Up Spool to it in order described like below.
2. Push the Blue Cap Lever towards the rear of the Printer and lift up to open the Printer Cover.
3. Unroll the paper about 400mm.
4. Ensure that the paper is being fed from the bottom of the roll.
5. Place the roll into the concave bottom of the Printer.
6. Put the leading edge of the paper over the Printer.
7. Close the Printer Cover.
8. Fold the end of the thermal paper about 20mm in length. Slide the leading end of the paper into the groove on the spindle of the Take-Up Spool and wind it onto the Spool two or three turns.
9. Place the Take-Up Spool into the Case-Lower behind the Printer above the roll paper.
10. If the paper is loose, rewind the Take-Up Spool to tighten the paper.

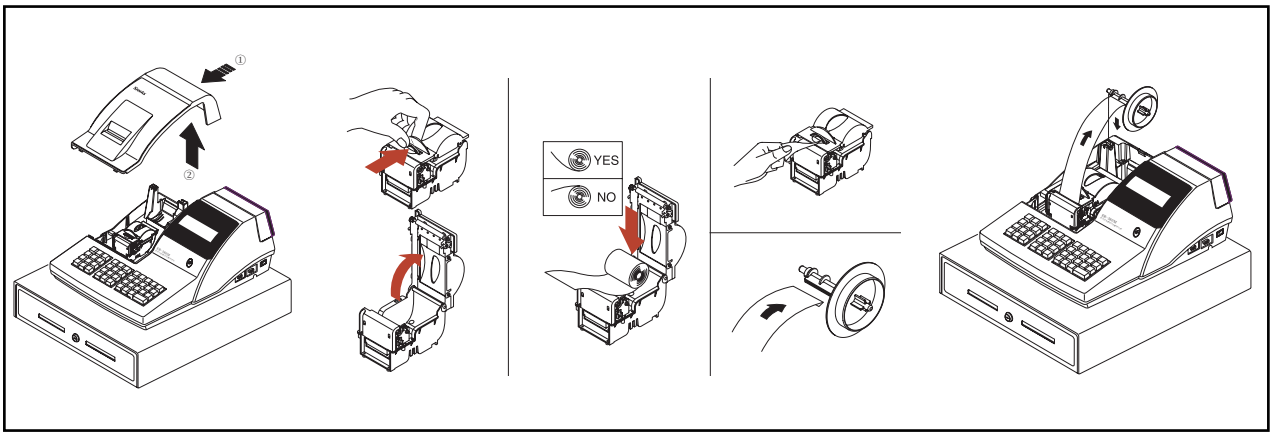


Figure 3-2 Paper & Spool Installation

3-2 Installation

3-2-3 RS-232C Serial Cable Installation

1. Connect the RS-232C serial cable to the RS-232C serial port on the right side of ECR.
2. Secure the serial cable with screws.
3. Connector the other end of the RS-232C serial Cable to your host computer.

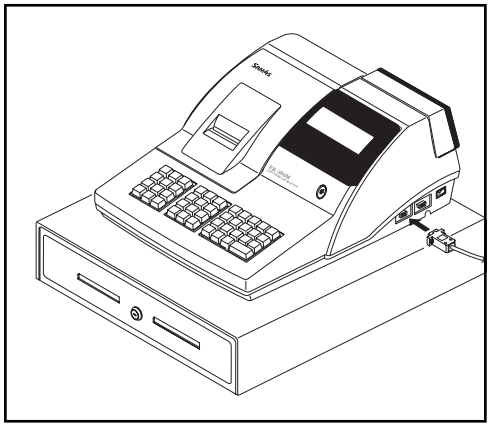


Figure 3-3 Cable Installation

3-2-4 Options

No.	Item	Description	Remark
1	RS-232 Serial Port	Serial#1	
2	Water Proof		
3	Dust Cover		
4	Memory	SRAM 4MBITs (4MBITs * 1)	On Main PBA

Table 3-1 Option

3-2-5 Supplies

No.	Item	Description	Remark
1	Paper Roll	1 EA	
2	Mode Key	VD, REG, X, Z, P, C	
3	User Manual	1 EA	
4	Spool	1 EA	

Table 3-2 Supplies

3-3 Operation

Note: Before using this Electronic Cash Register (ECR) for the first time, leave it powered ON in the REG mode for a at least 24 hours. This allows the Ni-Cad battery, which maintains the ECR's memory while the power is OFF, to fully charge.

3-3-1 Mode Switch

The position of the Mode Key determines the action of the ECR. The modes are as shown in Table 3-3

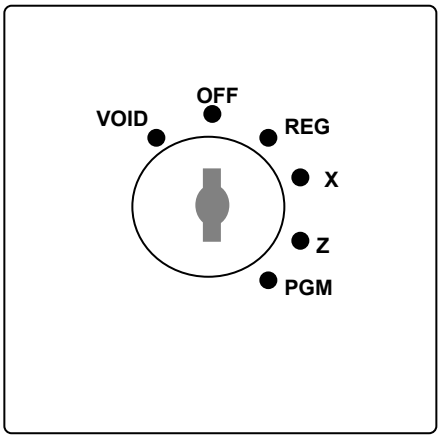


Figure3-4 Mode Switch

Mode	Function
VOID	Use to void (correct) items outside of a sale.
OFF	The Register is inoperable.
REG	Use for normal registrations.
X	Use to read register reports and perform other manager functions.
Z	Use to read register reports and reset totals to zero.
PGM	Use to program the register

Table3-3 Mode Switch Function

The mode switch can be used to access the following key lock positions.

Key	Accessible Position	Remark
VOID	Void, Off, Register, Manager	
X	Off, Register, Manager	
Z	Off, Register, Manager, Clear Totals	
PGM	Void, Off, Register, Manager, Clear Totals, Program	

Table3-4 Key Function

Note : The Key can be removed from the key lock in the OFF or REGISTER position.

3-3 Operation

3-3-2 Key Board Matrix (Dealer Option)

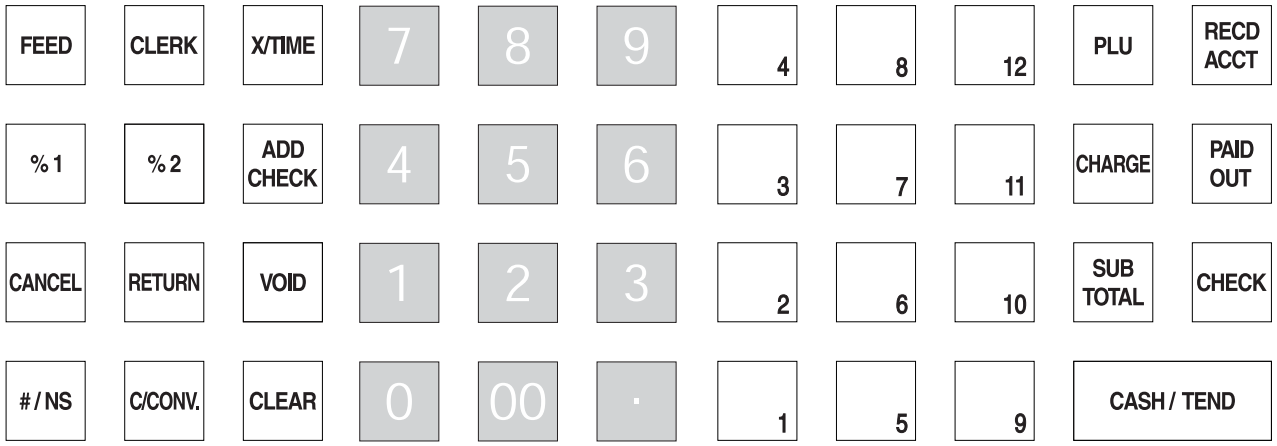


Figure3-5 Key Board (STD)

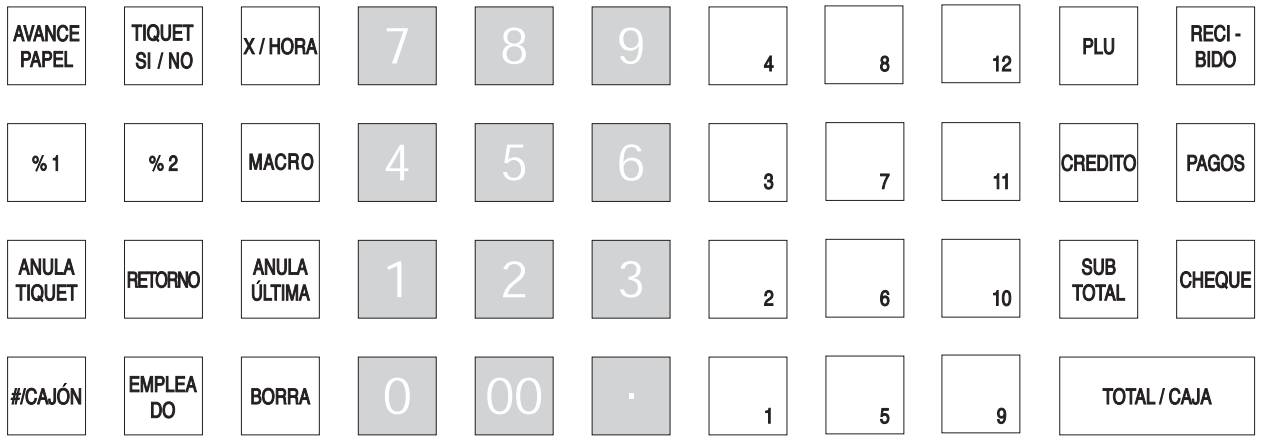


Figure3-6 Key Board (SPAIN)

3-3 Operation

3-3-2 Key Board Matrix (Dealer Option)

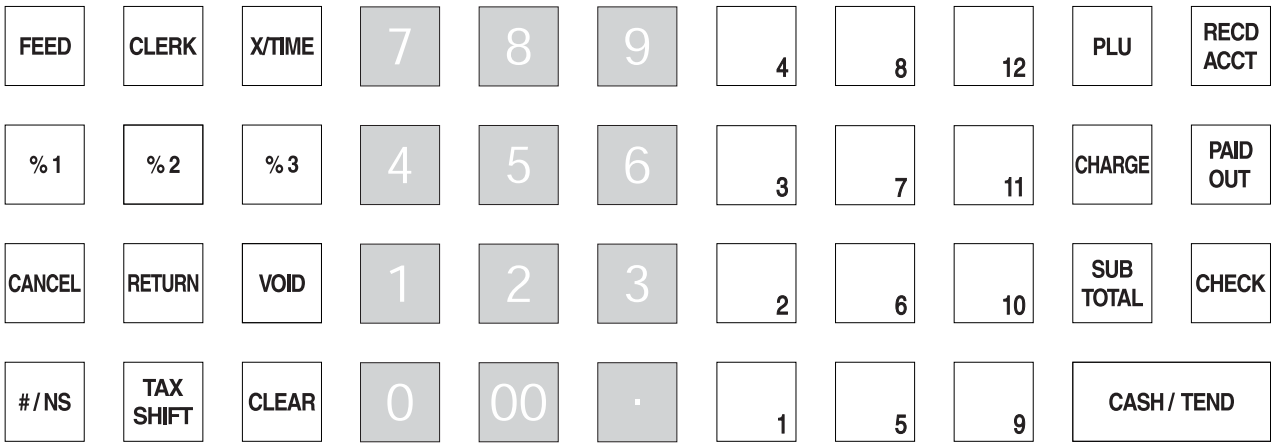


Figure3-7 Key Board (USA)

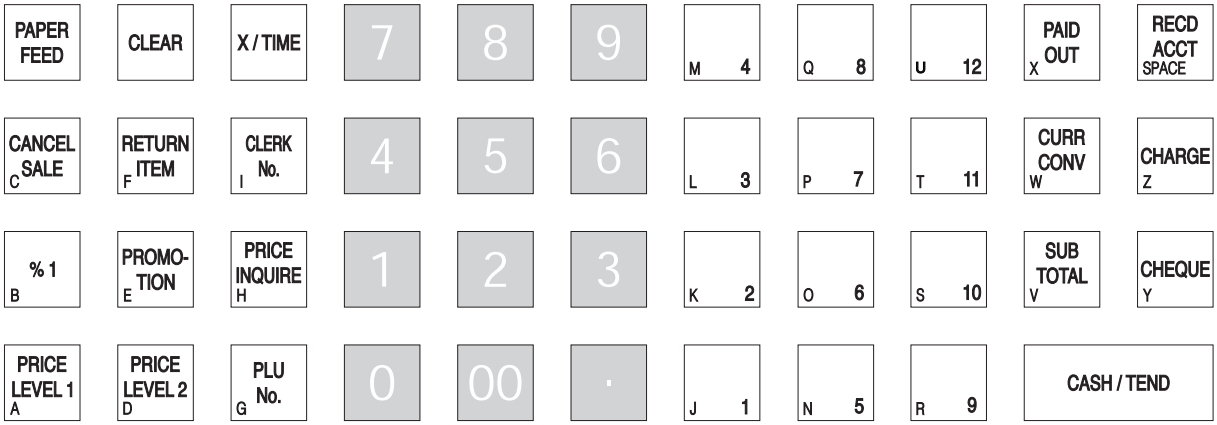


Figure3-8 Key Board (ENGLAND)

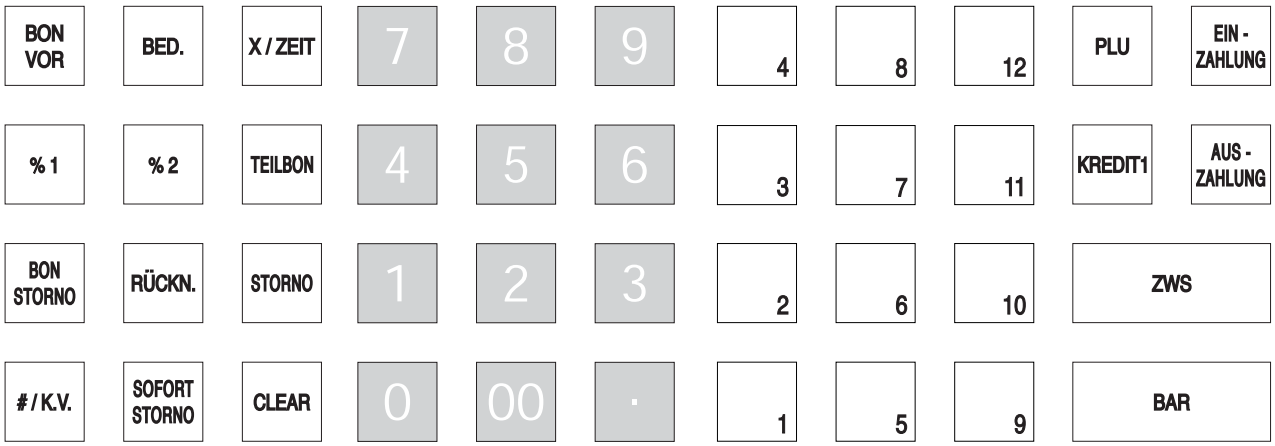


Figure3-9 Key Board (GERMANY)

3-3 Operation

3-3-3 Initial Clear

1. Turn off the power switch.
2. Turn the mode switch marked '**P**' to **P-MODE**.
3. Hold down the '**SBTL**' key on the keyboard and turn on the power switch at the same time.

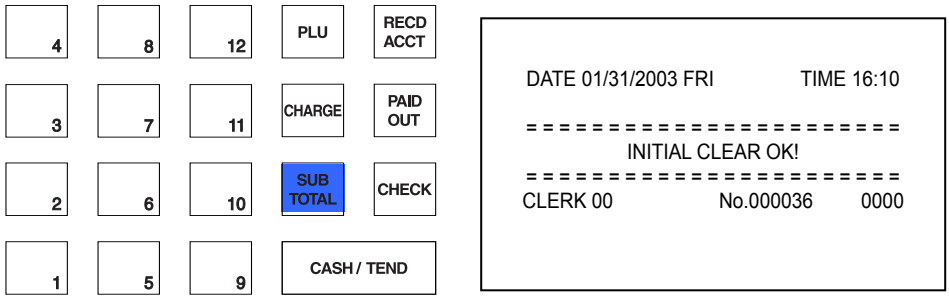


Figure3-10 Initial Clear Key & Print Sheet(ER380M)

3-3-4 All Clear

This step insures that the cash register is cleared of any totals or programming. After this procedure, the cash register is ready for programming and operation.

WARNING: This is a one time procedure. Do not repeat this procedure after the cash register is programmed, it causes all programs and totals to be erased and to be default.

Note : Service Mode is not marked in a mode painting part.
Service Mode spins the Mode Key once just in a Program Mode to the right direction.
And need " C Key " to execute a Service Mode.

1. Turn off the power switch.
2. Turn the Mode switch to Service Mode position.
3. Press and hold the **CHECK** key on key board and turn on the power switch at the same time.
4. When the buzzer beeps, press '**FEED**', '**#/NS**', '**RECD ACCT**', and '**CASH/TEND**' in sequence.
5. When memory is cleared, the register prints a message "RAM ALL CLEAR OK!"

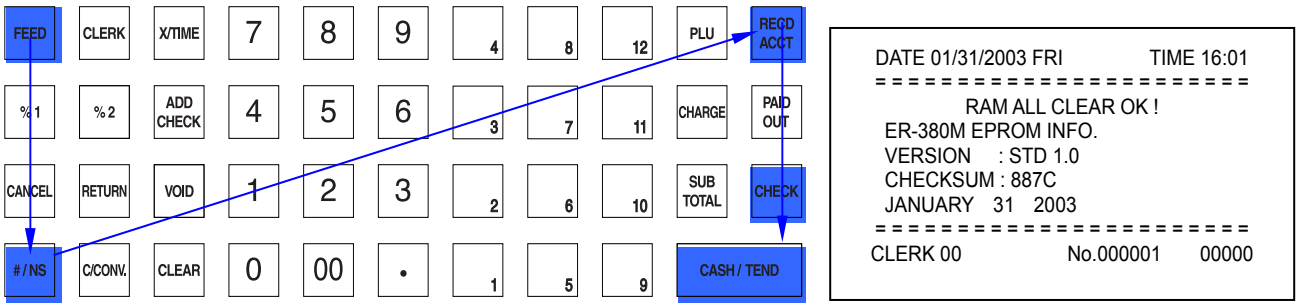


Figure3-11 All Clear Key Sequence & Print Sheet

3-3 Operation

3-3-6 Self Test

3-3-6-(a) Test Printer

1. Turn the Mode switch to Service Mode position.
1. Press '**1', '0'** and **'SBTL'** key on key board.
2. Then the printer prints the test pattern. The printing message shows some information sush as 'TM value','stbIdx (Strobe index)'.
3. After printing, The drawer is opened. Then the printer test is finished.

3-3-6-(b) Test Display

1. Press '**1', '1'** and **'SBTL'** key on key board.
2. Then the buzzer will work for 1 sec.
3. After testing the buzzer, Some characters are displayed on the rear VFD display

3-3-6-(c) Test Key Board

1. Press Press '**1', '2'** and **'SBTL'** key on key board.
2. Press any key you want on the key board.
3. The key code of pressed key will be showed on the VFD.
4. Turn the mode switch to any position to finish this test.

3-3-6-(d) Test Mode Switch

1. Press Press '**1', '3'** and **'SBTL'** key on key board.
2. Turn the mode switch to any position.
3. The corresponding Mode name will be showed on the VFD.

3-3-6-(e) Test RS232C

1. Install the serial loop back test jig. (Short pin 2 and pin 3 of DSUB connector)
2. Press Press '**1', '4'** and **'SBTL'** key on key board.
3. If error occurs, the message (232 NOGOOD) is displayed on VFD and the Buzzer beep. Then Press **"Clear"** key.

Note : When the ports is no connection or the cable is open, the Error occur.

4 Disassembly and Assembly

Caution :

· Before installation, be sure to turn off the power switch.
· Use gloves to protect your hand from being cut by the angle and the chassis.
· Connect all the cables correctly. When connecting or disconnecting the cables, be careful not to apply stress to the cables. (It may cause disconnection)
· Be careful not to bind interface cables and AC power cord together.

Note : Before disassembling, first of all separate the ASS'Y CASE UPPER(B) from the ASS'Y CASE LOWER(E)

4-1 Disassembling the Case Upper Block

4-1-1 Ass'y Case Upper

1. Open the ASS'Y COVER PRINTER(A) and lift it off. (Page9-1,9-2)
2. Remove the two screws(B-6:1pcs, B-12:1pcs) from the ASS'Y CASE LOWER(E). (Page9-1,9-2,9-3)
3. Separate the two harnesses(ⓓ,ⓕ) from the PBA-MAIN BOARD(E-8). (Page9-3,9-5)
4. Lift off the ASS'Y CASE UPPER(B) from the ASS'Y CASE LOWER(E). (Page9-1,9-2)

4-1-2 Ass'y Front Display (VFD)

1. Separate the PMO-WINDOW DISPLAY(B-1) from the ASS'Y CASE UPPER (B). (Page9-2,9-3)
2. Remove the four screws(B-15) from the ASS'Y CASE UPPER(B). (Page9-1,9-2,9-3)
3. Remove the four screws(B-17) from the IPR-BRKT WINDOW PCB(B-16). (Page9-3)
4. Separate the FRONT DISPLAY BOARD(B-16) from the IPR-BRKT WINDOW PCB (B-14). (Page9-3)
3. Separate the two harnesses(ⓥ,ⓓ) from the FRONT DISPLAY BOARD(B-16). (Page9-3)

4-1-3 Ass'y Front Display (LCD)

1. Separate the PMO-WINDOW DISPLAY(B-18) from the ASS'Y CASE UPPER (B). (Page9-1,9-3)
2. Remove the four screws(B-15) from the ASS'Y CASE UPPER(B). (Page9-1,9-3)
3. Remove the four screws(B-17) from the PMO-HOLDER DISPLAY(B-14). (Page9-3)
4. Separate the FRONT DISPLAY BOARD(B-16) from the PMO-HOLDER DISPLAY (B-14). (Page9-3)
3. Separate the harnesses(ⓕ) from the FRONT DISPLAY BOARD(B-16). (Page9-3)

4-1-4 Ass'y Rear (Turret) Display

1. First of all, separate the harness(ⓥ,ⓓ) of the REAR DISPLAY BOARD(B-9) from the FRONT DISPLAY BOARD (B-16). (Page9-3)
2. Separate the PMO-TURRET BODY (B-10) from the ASS'Y CASE UPPER (B). (Page9-1,9-2,9-3)
3. Separate the PMO-WINDOW TURRET(B-8) and the REAR DISPLAY BOARD(B-9) from the PMO-TURRET BODY (B-10).(Page9-3)

4-1-5 Ass'y Cover Mode Switch

1. Separate the ASS'Y COVER MODE S/W(B-7) from ASS'Y CASE UPPER(B). (Page9-1,9-2,9-3)
2. Remove the two screws(B-5) on the ASS'Y COVER MODE S/W(Reference:B-2) and separate the ELA ETC-MODE KEY ASS'Y from the PMO-COVER MODE S/W(B-2). (Page9-3)
3. Remove the two screws(B-3) on the ELA ETC-MODE KEY ASS'Y and separate the IPR-BRKT MODE S/W(B-4) and the ELA ETC-MODE KEY ASS'Y. (Page9-3)

4-2 Disassembling the Case Lower Block

4-2-1 Ass'y Printer

1. Open the ASS'Y COVER PRINTER(A) and lift it off. (Page9-1,9-2)
2. Separate the GROUND WIRE(ⓐ,ⓑ) from the PMO-PAPER SUPPLY(C-37). (Page9-7)
3. Remove the screw(C-42) from the PMO-PAPER SUPPLY (C-37) and lift up the PMO-COVER FRONT(C-41). (Page9-7)
4. Remove the four screws(C-43) of the PMO-PAPER SUPPLY (C-37). (Page9-7)
5. Separate the ASS'Y PRINTER(C) from the ASS'Y CASE LOWER(E). (Page9-1,9-2)

4-2-2 Ass'y Spool Motor

1. Separate the harness(ⓜ) of the ELA-ETC MOTOR ASS'Y(E-26) from the PBA-MAIN BOARD(E-8). (Page9-3)
2. Remove the ELA-MOTOR ASS'Y(E-26) from the PMO-CASE LOWER(E-24). (Page9-3)
3. Separate the ELA-ETC MOTOR ASS'Y(E-29) from the PMO-HOLDER MOTOR(E-27) .(Page9-3)
4. Separate the RCT-MOTOR (E-28) from the ELA-ETC MOTOR ASS'Y(E-29).(Page9-3)

4-2-3 Ass'y Main PBA, Fiscal PBA and I/F PBA

1. Separate the nine harnesses(ⓒ,ⓓ,ⓔ,ⓜ,ⓠorⓡ,C-40,E-3,E-4,D-10) and remove the four screws(E-2). Lift up the PBA-MAIN BOARD(E-8).(page9-5)
2. Separate the harness(ⓒ) and lift up the ASS'Y FISCAL BOARD(E-6) from the PMO-CASE LOWER(E-18).(page9-5)
3. Separate the harness (ⓝ) and Remove the two screws(E-28). (page9-5)
4. Lift up the I/F BOARD(E-16).(page9-3)

4-2-4 Ass'y Power PBA, and Trans Power.

1. Separate the harnesses(ⓜ,ⓕ) and Remove the two screws(E-9). (page9-5)
2. Separate the TRANS-POWER (E-10) from the IPR-BRKT TRANS(E-21).(page9-5)
3. Separate the harnesses(ⓕ,ⓖ,ⓩ) and Remove the two screws(E-11). (page9-5)
4. Lift up the PBA SUB POWER SW(E-12) from the IPR-BRKT TRANS(E-21).(page9-5)
5. Remove the eight screws(E-13:2PCS, E-14:1PCS,E-17:3PCS,E-15:2PCS) and Separate the IPR-BRKT TRANS(E-21) from the PMO-CASE LOWER(E-18).(page9-5)

5 Maintenance and Adjustment

5-1 Maintenance

5-1-1 Cleaning the Printer Head

Paper dust on the heating elements may lower the print quality. In this case, clean the print head as follows:
After printing, the printer head can be very hot. Be careful not to touch it. Also let it cool before you clean it.
Do not damage the printer head by touching it with your fingers or any hard object.

1. Turn the ECR power switch off.
2. Open the Printer Cover.
3. Open the cover of paper supplier with pushing the blue-cap lever.
4. Clean the Printer Head Thermal Element with a cotton swab moistened with alcohol solvent. (ethanol, methanol or IPA)
5. After confirming that alcohol solvent has been dried up completely, close the cover of paper supplier until be locked.

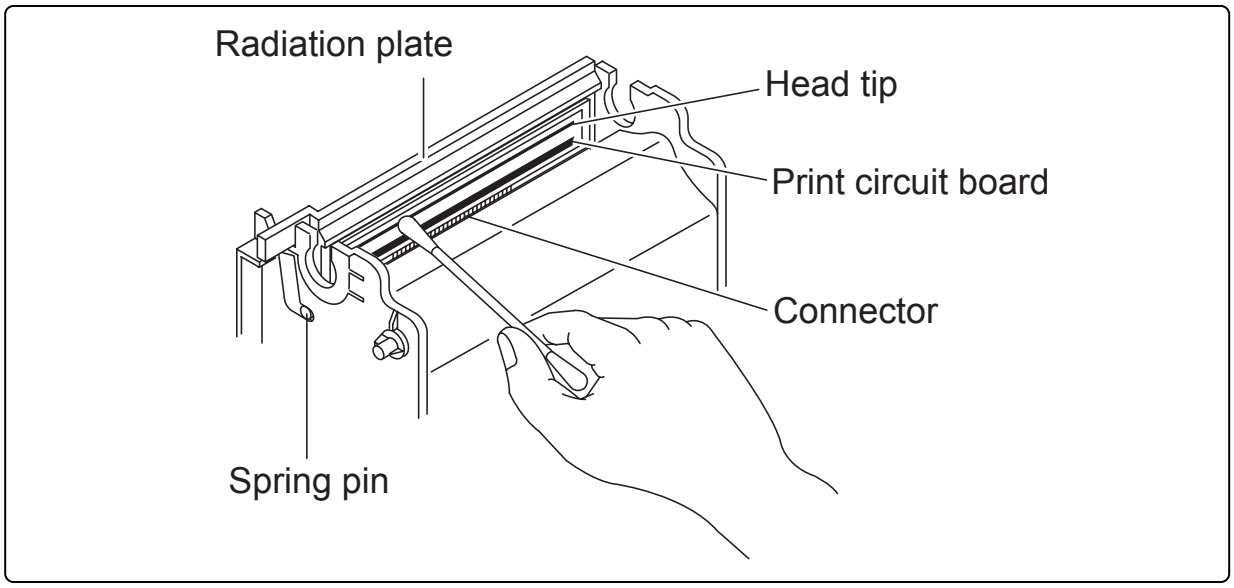


Figure 5-1 Clean the Printer Head

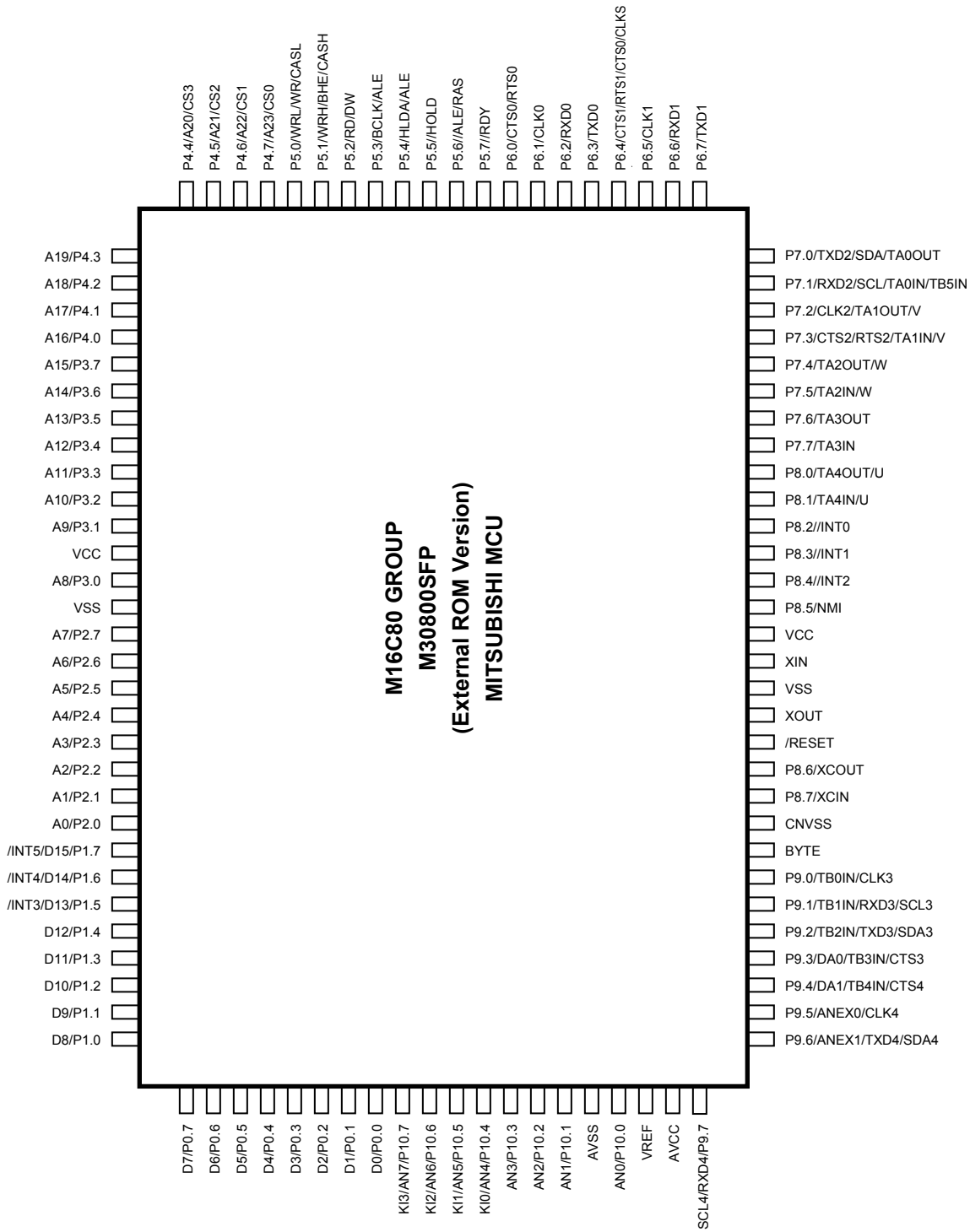
Caution: Note that the thermal head(Thermal Element and Radiation Plate) becomes very hot during normal operation. To prevent the danger of burn injury from thermal, be sure to wait for about 10 minutes after turning power off before beginning the cleaning.

MEMO

6 Reference Information

6-1 Semiconductor Base Diagram

6-1-1 CPU



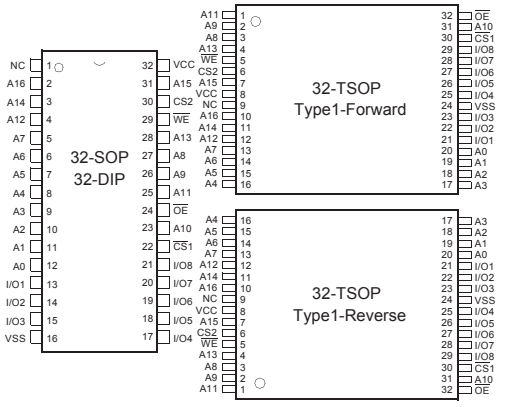
6-1 Semiconductor Base Diagram

Pin	Port	Function	I/O	Pin	Port	Function	I/O
1	P9.6	VFD Display Serial Data	Out	51	P4.3	Address 19	Out
2	P9.5	VFD Display Clock	Out	52	P4.2	Address 18	Out
3	P9.4	SEN_DISPDISCON	In	53	P4.1	Address 17	Out
4	P9.3	DTR2	Out	54	P4.0	Address 16	Out
5	P9.2	Thermal Printer Head Serial Data	Out	55	P3.7	Address 15	Out
6	P9.1	Thermal Printer Head Serial Latch	Out	56	P3.6	Address 14	Out
7	P9.0	Thermal Printer Head Serial Clock	Out	57	P3.5	Address 13	Out
8	BYTE	+5V (VCC)	-	58	P3.4	Address 12	Out
9	CNVSS	+5V (VCC)	-	59	P3.3	Address 11	Out
10	P8.7	VPH_ONOFF	Out	60	P3.2	Address 10	Out
11	P8.6	RTC Serial Clock	-	61	P3.1	Address 9	Out
12	RESET	/RESET	In	62	VCC	+5V / VCC	-
13	XOUT	N.C	-	63	P3.0	Address 8	Out
14	VSS	GND	-	64	VSS	Ground	-
15	XIN	System Clock (14.7456MHz)	In	65	P2.7	Address 7	Out
16	VCC	+5V (VCC)	-	66	P2.6	Address 6	Out
17	P8.5	Pull-Up (VCC)	-	67	P2.5	Address 5	Out
18	P8.4	ALL_CLEAR	Out	68	P2.4	Address 4	Out
19	P8.3	Interrupt Power Fail Detect	In	69	P2.3	Address 3	Out
20	P8.2	Interrupt Power Fail Detect	In	70	P2.2	Address 2	Out
21	P8.1	Memory Chip Enable	Out	71	P2.1	Address 1	Out
22	P8.0	Buzzer	Out	72	P2.0	Address 0	Out
23	P7.7	TPH_PSTB#2	Out	73	P1.7	DSR #2	In
24	P7.6	TPH_PSTB#1	Out	74	P1.6	SEN_DWRCOMP	In
25	P7.5	LF Motor Phase B	Out	75	P1.5	DRAWER	Out
26	P7.4	LF Motor Phase A	Out	76	P1.4	Spool Motor On/Off	Out
27	P7.3	LF Motor Enable	Out	77	P1.3	Fiscal Write Voltage On/Off	Out
28	P7.2	RTC Serial Data	-	78	P1.2	Fiscal EPROM /CS(Chip Select)	Out
29	P7.1	RXD #2	In	79	P1.1	Fiscal EPROM Address 17	Out
30	P7.0	TXD #2	Out	80	P1.0	Fiscal EPROM Address 16	Out
31	P6.7	TXD #1 (RS-232C #2)	Out	81	P0.7	Data 7	In/Out
32	P6.6	RXD #1 (RS-232C #2)	In	82	P0.6	Data 6	In/Out
33	P6.5	DTR #1 (RS-232C #2)	Out	83	P0.5	Data 5	In/Out
34	P6.4	DSR #1 (RS-232C #2)	In	84	P0.4	Data 4	In/Out
35	P6.3	TXD #0 (RS-232C #1)	Out	85	P0.3	Data 3	In/Out
36	P6.2	RXD #0 (RS-232C #1)	In	86	P0.2	Data 2	In/Out
37	P6.1	DSR #0 (RS-232C #1)	In	87	P0.1	Data 1	In/Out
38	P6.0	DTR #0 (RS-232C #1)	Out	88	P0.0	Data 0	In/Out
39	P5.7	Pull-Up (VCC)	-	89	P10.7	SEN_LEVER	In
40	P5.6	N.C (ALE)	-	90	P10.6	SEN_DISCON	In
41	P5.5	Pull-Up (VCC)	-	91	P10.5	ADC_BAT	In
42	P5.4	N.C (/HLDA)	-	92	P10.4	SEN_PEND_R	In
43	P5.3	N.C (BCLK)	-	93	P10.3	MODE_SIG	Out
44	P5.2	/RD (Read)	Out	94	P10.2	LCD INSTRUCTION	Out
45	P5.1	N.C (/WRH)	-	95	P10.1	LCD READ/WRITE	Out
46	P5.0	/WR (Write)	Out	96	AVSS	Ground	-
47	P4.7	/CS0 (Chip Select 0)	Out	97	P10.0	TPH_Thermister(R-Side)	In
48	P4.6	/CS1 (Chip Select 1)	Out	98	VREF	ADC Reference Voltage Input	In
49	P4.5	/CS2 (Chip Select 2)	Out	99	AVCC	+5V (VCC)	-
50	P4.4	/CS3 (Chip Select 3)	Out	100	P9.7	VFD Display Latch	Out

6-1 Semiconductor Base Diagram

6-1-2 Memory

PIN DESCRIPTION



Name	Function
$\overline{CS}_1$, CS_2	Chip Select Input
$\overline{OE}$	Output Enable Input
$\overline{WE}$	Write Enable Input
I/O_1~I/O_8	Data Inputs/Outputs
A_0~A_{16}	Address Inputs
Vcc	Power
Vss	Ground
NC	No Connection

FUNCTIONAL BLOCK DIAGRAM

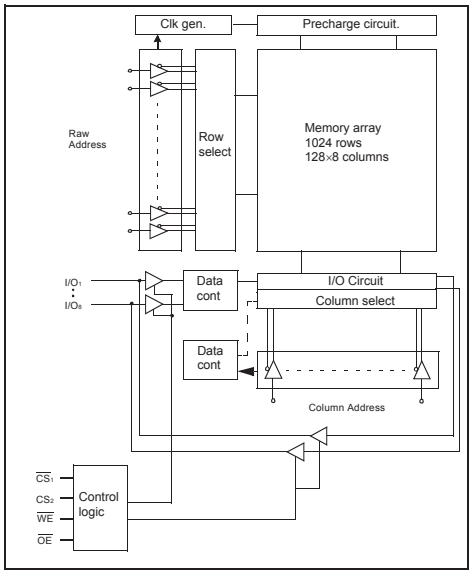
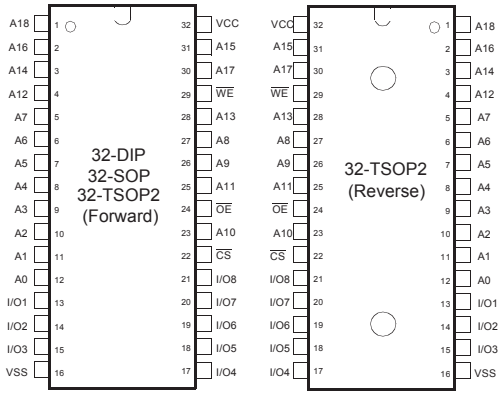


Figure 6-1 SRAM K6T1008C2E Specification

PIN DESCRIPTION



Pin Name	Function
$\overline{WE}$	Write Enable Input
$\overline{CS}$	Chip Select Input
$\overline{OE}$	Output Enable Input
A_0~A_{18}	Address Inputs
I/O_1~I/O_8	Data Inputs/Outputs
Vcc	Power
Vss	Ground

FUNCTIONAL BLOCK DIAGRAM

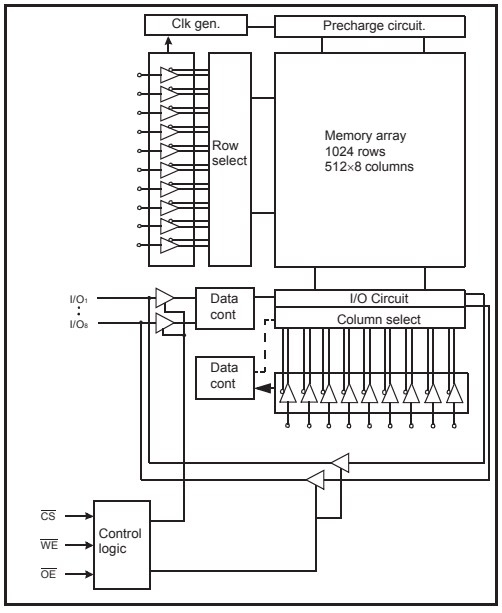


Figure 6-2 SRAM K6T4008C2E Specification

6-1 Semiconductor Base Diagram

6-1-2 Memory

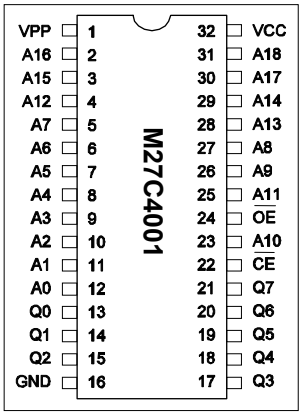


Figure 6-3 EPROM M27C4001 Specification

6-1-3 Logic ICs

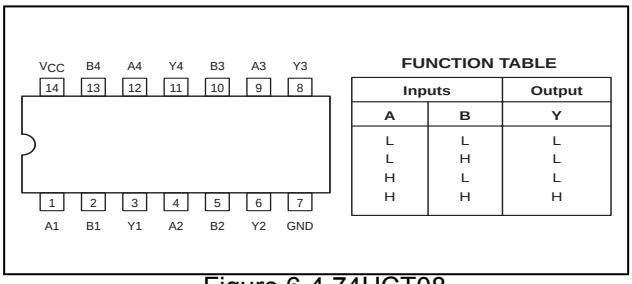


Figure 6-4 74HCT08

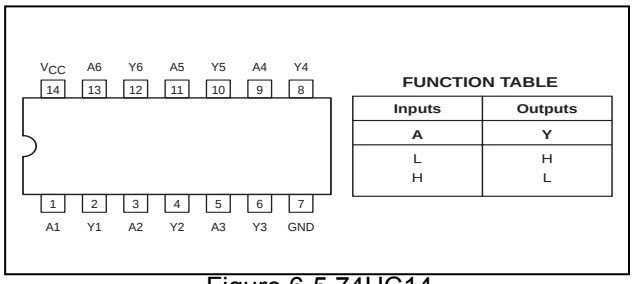


Figure 6-5 74HC14

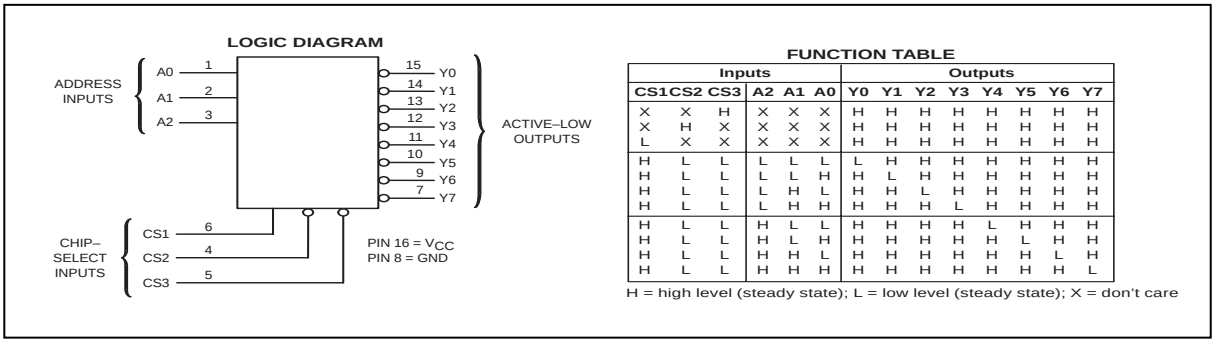

LOGIC DIAGRAM
ADDRESS INPUTS
A0 1
A1 2
A2 3
15 Y0
14 Y1
13 Y2
12 Y3
11 Y4
10 Y5
9 Y6
7 Y7
ACTIVE–LOW OUTPUTS
CHIP–SELECT INPUTS
CS1 6
CS2 4
CS3 5
PIN 16 = VCC
PIN 8 = GND
FUNCTION TABLE
Inputs Outputs
CS1 CS2 CS3 A2 A1 A0 Y0 Y1 Y2 Y3 Y4 Y5 Y6 Y7
X X H X X X H H H H H H H H
X H X X X X H H H H H H H H
L X X X X X H H H H H H H H
H L L L L L L H H H H H H H
H L L L L H H L H H H H H H
H L L L H L H H L H H H H H
H L L L H H H H H L H H H H
H L L H L L H H H H L H H H
H L L H L H H H H H L H H H
H L L H H L H H H H H L H H
H L L H H H H H H H H H H L
H = high level (steady state); L = low level (steady state); X = don't care

Figure 6-6 74HC138

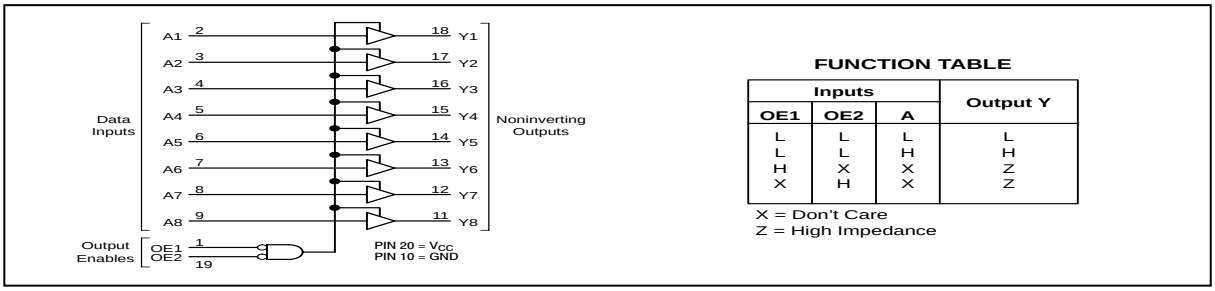
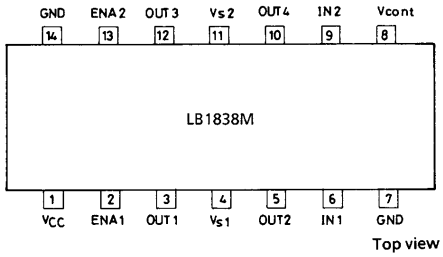


Figure 6-7 74HC541

6-1 Semiconductor Base Diagram

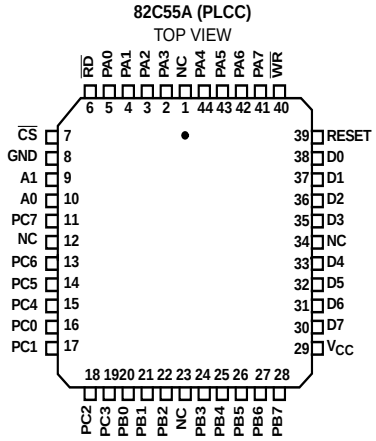
6-1-4 Other ICs



Truth Table

IN 1, 2	ENA 1, 2	OUT 1, 3	OUT 2, 4	Mode
L	H	H	L	Forward
H	H	L	H	Reverse
L	L	OFF	OFF	Standby
H	L	OFF	OFF	Standby

Figure 6-8 Motor Driver LB1838 Specification



82C55A BASIC OPERATION

A1	A0	RD	WR	CS	INPUT OPERATION (READ)
0	0	0	1	0	Port A → Data Bus
0	1	0	1	0	Port B → Data Bus
1	0	0	1	0	Port C → Data Bus
1	1	0	1	0	Control Word → Data Bus
					OUTPUT OPERATION (WRITE)
0	0	1	0	0	Data Bus → Port A
0	1	1	0	0	Data Bus → Port B
1	0	1	0	0	Data Bus → Port C
1	1	1	0	0	Data Bus → Control
					DISABLE FUNCTION
×	×	×	×	1	Data Bus → Three-State
×	×	1	1	0	Data Bus → Three-State

Figure 6-9 82C55A Specification

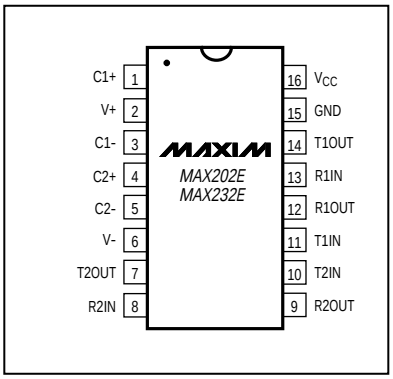
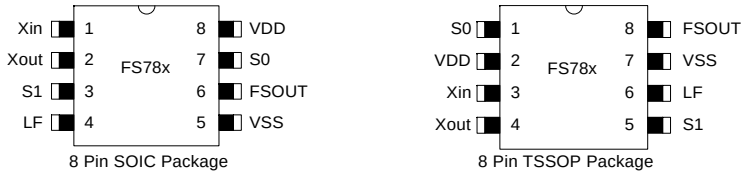


Figure 6-10 RS-232 Transceiver MAX232

6-1 Semiconductor Base Diagram

6-1-4 Other ICs



Refer to page 12 for package dimensions.

Pin Description

Pin No.	Pin Name	I/O	TYPE	Description
1/2	Xin / Xout	I/O	Analog	Pins form an on-chip reference oscillator when connected to terminals of an external parallel resonant crystal. Xin may be connected to TTL/CMOS external clock source. If Xin connected to external clock other than crystal, leave Xout (pin 2) unconnected.
7/3	S0 / S1	I	CMOS/TTL	Digital control inputs to select input frequency range and output frequency scaling. Refer to Tables 7 & 8 for selection. S0 has internal pulldown. S1 has internal pullup.
4	LF	I	Analog	Loop Filter. Single ended tri-state output of the phase detector. A two-pole passive loop filter is connected to Loop Filter (LF).
6	FSOUT	O	CMOS/TTL	Modulated Clock Frequency Output. The center frequency is the same as the input reference frequency for FS781. Input frequency is multiplied by 2x and 4x for FS782 and FS784 respectively.
8	VDD	P	Power	Positive Power Supply.
5	VSS	P	Power	Power Supply Ground

Table 1

Output Frequency Selection

Product Number	FSOUT Frequency Scaling	Description
FS781	1x	1x Modulated Frequency of Input Clock
FS782	2x	2x Modulated Frequency of Input Clock
FS784	4x	4x Modulated Frequency of Input Clock

Table 2. FSOUT SSCG (Modulated Output Clock) Product Selection

Figure 6-11 SSCG FS781 Specification

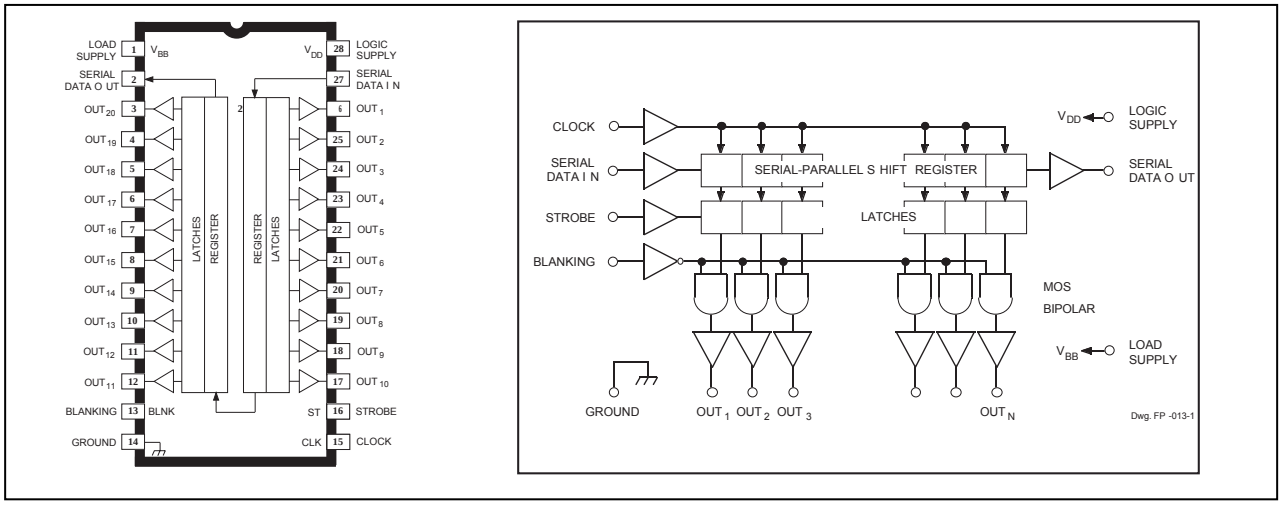


Figure 6-12 VFD Driver UDN5812 Specification

6-1 Semiconductor Base Diagram

6-1-4 Other ICs

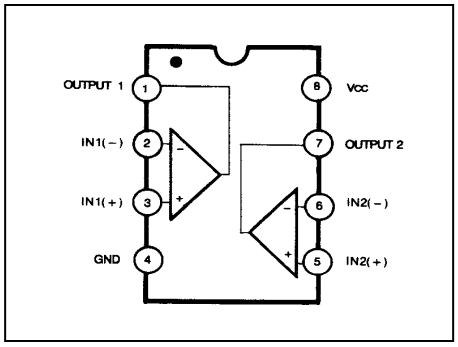


Figure 6-13 KA393

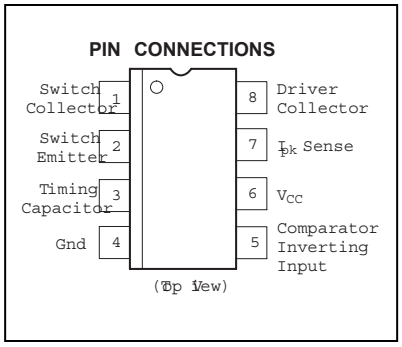


Figure 6-14 KA34063

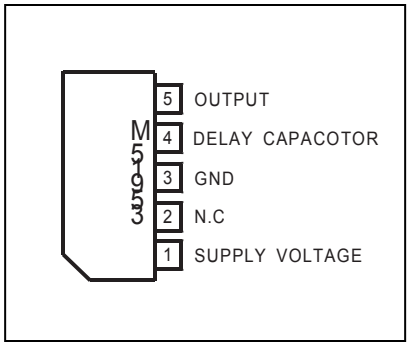


Figure 6-15 M51953

6-1-5 TR , Diode

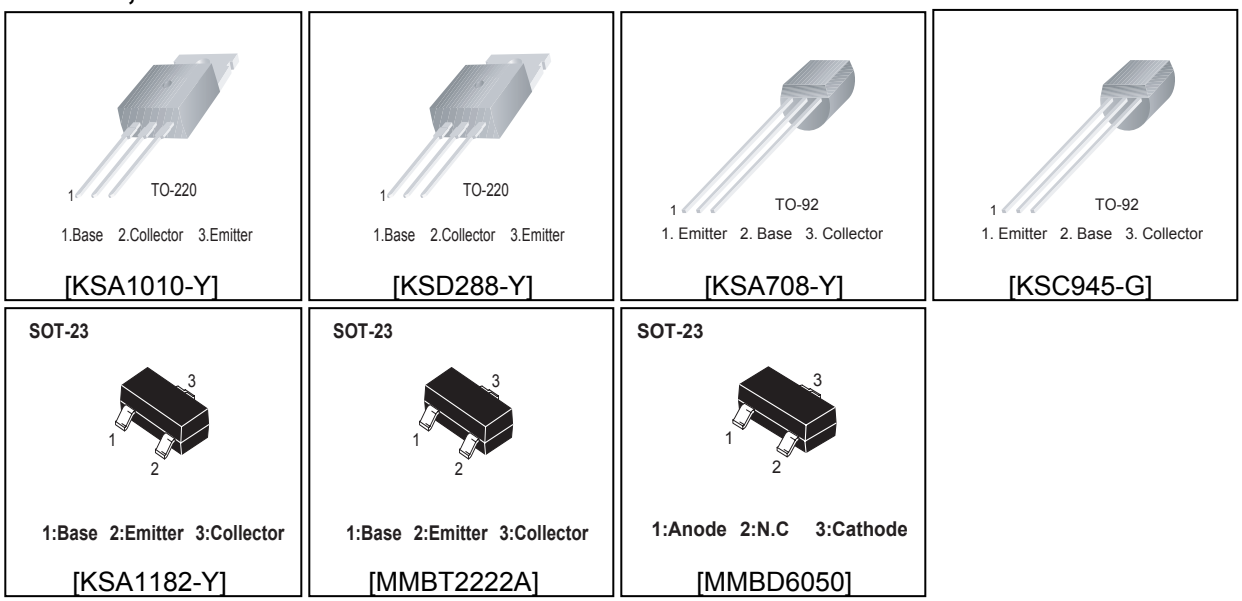


Figure 6-16 Transistor & Diode

MEMO

7 Special Circuit Descriptions

7-1 Power Circuit

This system is operated under 120Vac or 230Vac. All data is saved by the Battery when the Main power is turned off. The power circuit supplies the five different DC voltage sources and one AC voltage source.

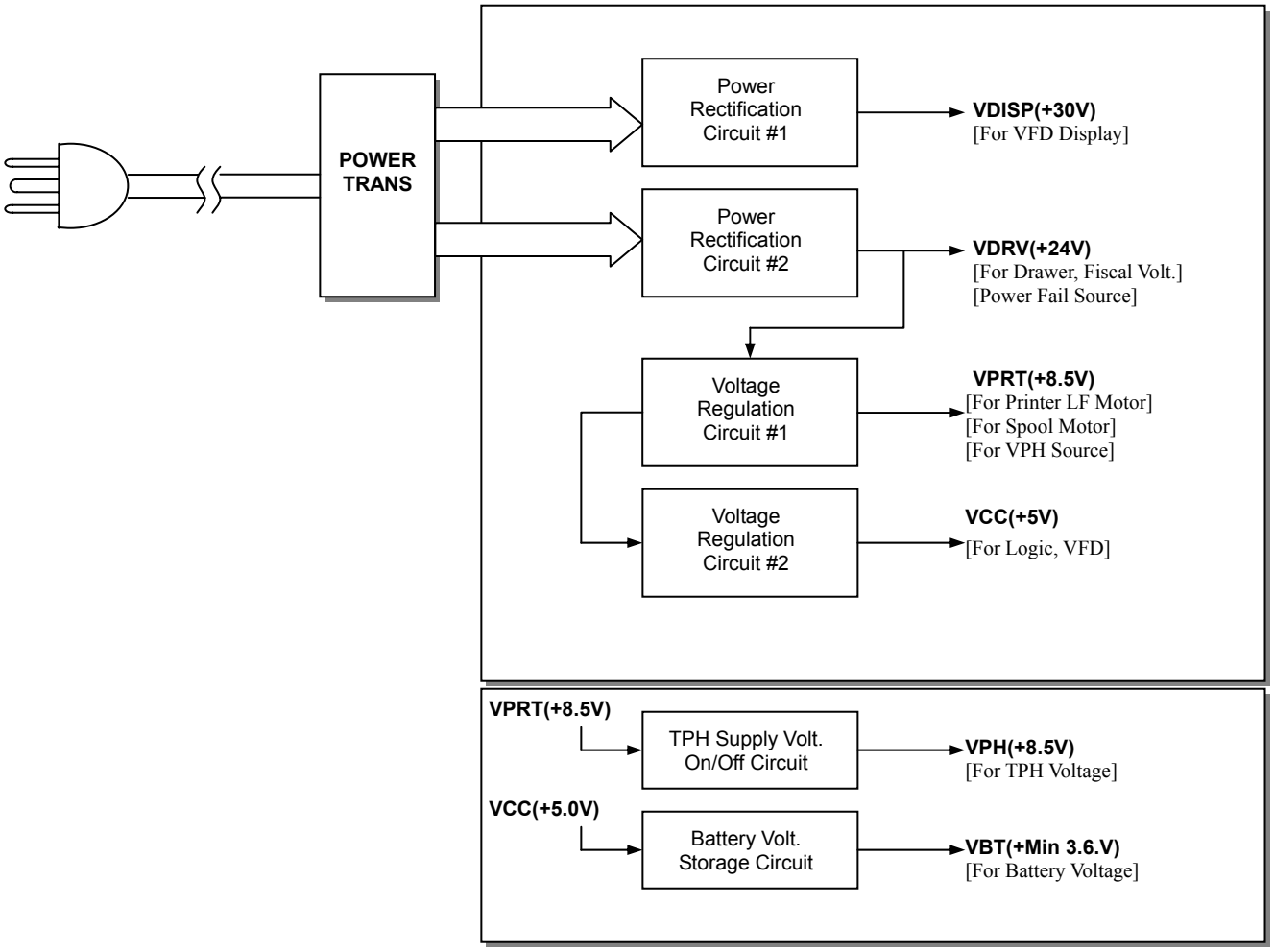


Figure 7-1 Power Block Diagram

No.	Voltage	Description
1	VDISP (+30VDC)	VFD Grid/Anode Driving Voltage
2	VDRV (+24VDC)	Cash Drawer Solenoid Driving / Fiscal Writing Voltage
3	VCC (+5VDC)	Logic IC Driving / VFD Filament Voltage
4	VPRT (+8.5VDC)	Thermal Printer Step Motor.
5	VPH (+8.5VDC)	Thermal Printer Head Driving Voltage
6	VBT (+Min 3.6VDC)	Battery Voltage

Table 7-1 Power Source Voltage Descriptions

7-1 Power Circuit

7-1-1 VDISP : +30VDC

+30VAC is rectified by the bridge diode (D4,D5,D6,D7) and the capacitors(C40,C27).

7-1-2 VDRV : +24VDC

+24VDC is produced by the bridge diode (BD1) and the capacitors(C5,C25). This voltage is used as a Cash Drawer Solenoid driving voltage and a source voltage of the other voltage sources.

7-1-3 VCC : +5VDC

+5Vdc Logic driving voltage is produced by U5(MC7805). The voltage is smoothed by C50(100uF) and then +5Vdc Logic voltage is produced .

7-1-4 VPRT : +8.5VDC

+8.5VDC Thermal Printer driving voltage is produced by the step-down dc-dc converter U4(34063A). That is, U4 produces rectangular wave at the collector of Q10(A1010) by switching Q6 using +24VDC. This makes D3(IN5822) and L6 store energy. The voltage is smoothed by C34(470uF) and then +8.5VDC thermal printer driving voltage is produced .

7-1-5 VPH : +8.5Vdc

+8.5VDC Thermal Printer Head driving voltage is produced by VPH_ONOFF signal of CPU and the related Circuit(Q11,Q16,17) on Main PWB. The Source Voltage is VPRT (8.5V).

7-1-6 VBT : +Min 3.6Vdc

The Source Voltage is VCC(5V). When AC Power is off, VBT is supplied to SRAM, RTC for saving the data.

7-2 RESET and Power Fail Circuit

7-2-1 Reset Circuit

Reset signal is a signal in order to start-up CPU under Power-on. Reset circuit uses a reset IC M51953B(U8). When +5VDC is fallen under 4.3Vdc by Power-off, reset signal prohibits the system from abnormal operation by lowering down to 0V.

7-2-2 Power Fail Detect Circuit

Power Fail Sensing Circuit detects sudden power-off to backup the needed data and current CPU status into RAM before 35ms just before +5V drops. When power is turned on, the CPU does the operations which were working before power-off. This system is designed to sense the time when the AC Line voltage is goes down to 89Vac(USA) or 170Vac(Europe) . That is, when +24Vdc goes down to +14Vdc.

The waveform of power fail signal refer to Figure 7-2

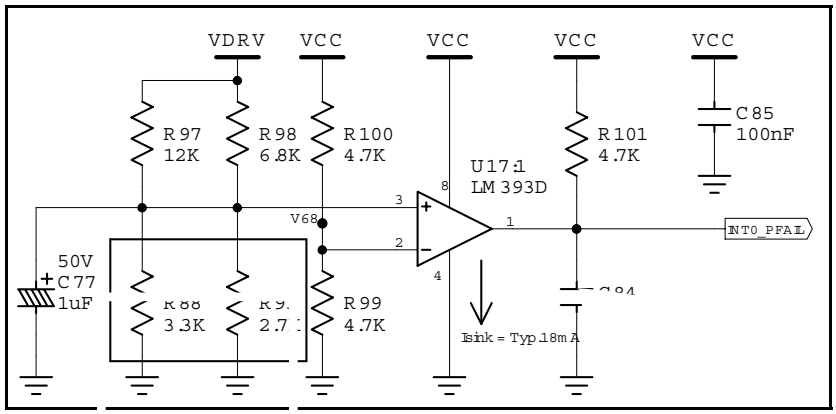


Figure 7-2 Power Fail Detect Circuit

7-3 Battery, RTC(Clock), Buzzer, Cash Drawer and VFD Circuits

7-3-1 Battery Circuit

Battery Circuit supplies SRAMs and RTC (U14, RS5C372A) with voltage source and is used to drive clock and to save data when the main Power is turned off. When the Power is turned on, VCC source(+5VDC) is supplied to SRAMs and RTC through the D14(SK14), and the Battery is charged. When the Power is turned off, D14 is shut and the source charged in the Battery is supplied to SRAM and RTC.

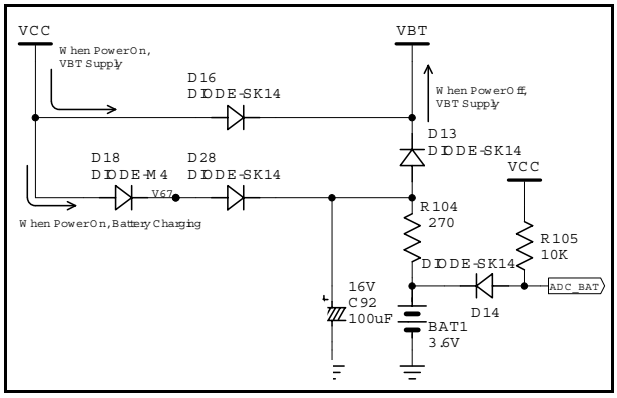


Figure 7-3 Battery Circuit

7-3-2 RTC(Clock) Circuit

This uses an Clock IC RS5C372A, is driven by the Battery when the main Power is turned off.

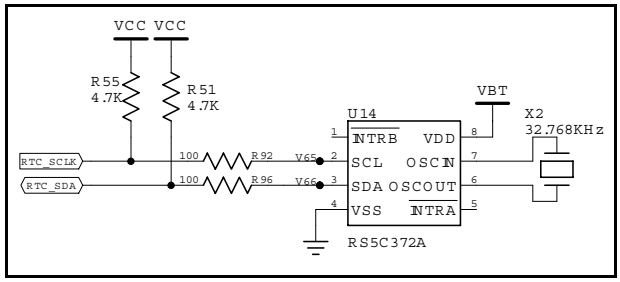


Figure 7-4 RTC Circuit

7-3-3 Buzzer Driving Circuit

The Buzzer is used to inform several kinds of states which occur under system operating and gives some information to users by controlling the P8.0 pin of CPU. The frequency of buzzer is 2[KHz]

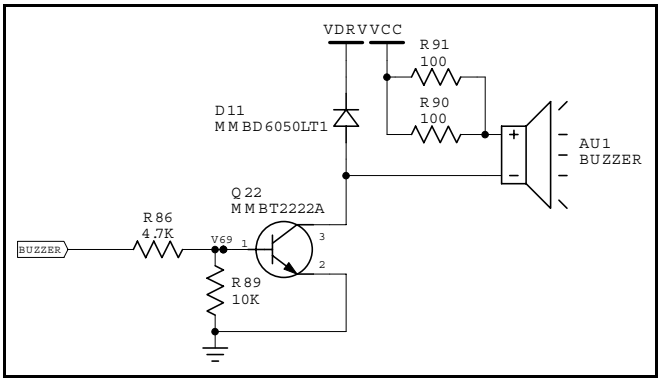


Figure 7-5 Buzzer Circuit

7-3 Battery, RTC(Clock), Buzzer and Cash Drawer Circuits

7-3-4 Cash Drawer Driving Circuit

The circuit is used for opening cash drawer and driven by the Q5(MMBT222A),Q1(KSD288-Y). When its state is high level signal, Q5(MMBT222A) or Q1 (KSD288-Y) drive the solenoid to open the cash drawer. As an optional item, we provide sensor switch (we call it a compulsory switch) which checks the drawer whether it is opened or not. This sensor switch turns on for the drawer open condition, and turns off for the other.

Caution: Make sure that the Cash Drawer solenoid resistance is more than 20Ω

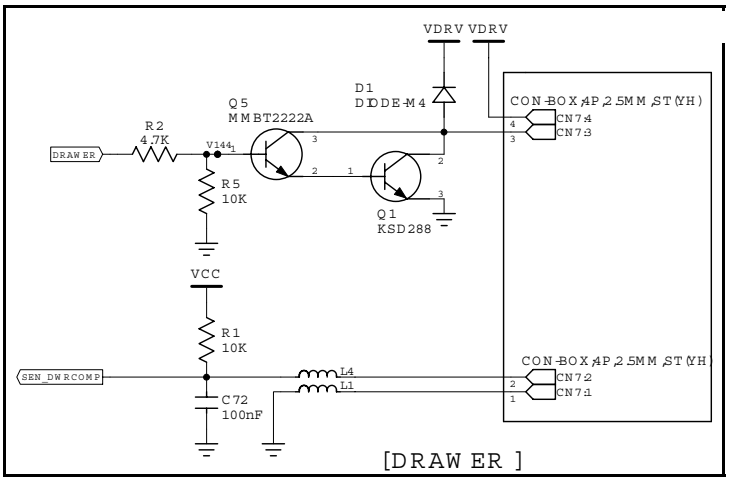


Figure 7-6 Cash Drawer Block Circuit

7-3-5 VFD Display Block Circuits

This uses 10digit Fluorescent Display and uses UCN5812AF (is located on the Front VFD PCB) for the driver. CPU sends Display data to the driver repeatedly having given time interval in series and then Fluorescent Display is operated.

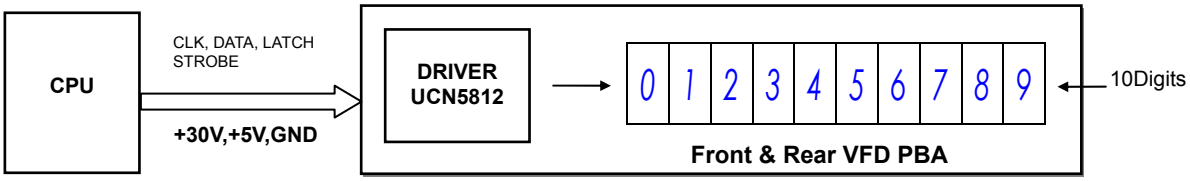


Figure 7-7 VFD Diagram & Waveform

7-4 Keyboard Circuit

The Key Board Circuit consist of the scan signal of 8 lines and the return signal of 8-line. The CPU sends repeatedly and continuously the scan data S0～S7 through the 74HCT138(U21). The key information input in the return signal if the specific key is pressed during the given time. The CPU reads the data through U23(74HC541) and analyzes what key is pressed and transmits this information to the CPU, then performs the selected function. The Key Board Circuit sends the mode scan signal to the Key-lock switch and takes the return data through the U23(74HC541) and performs the selected function.

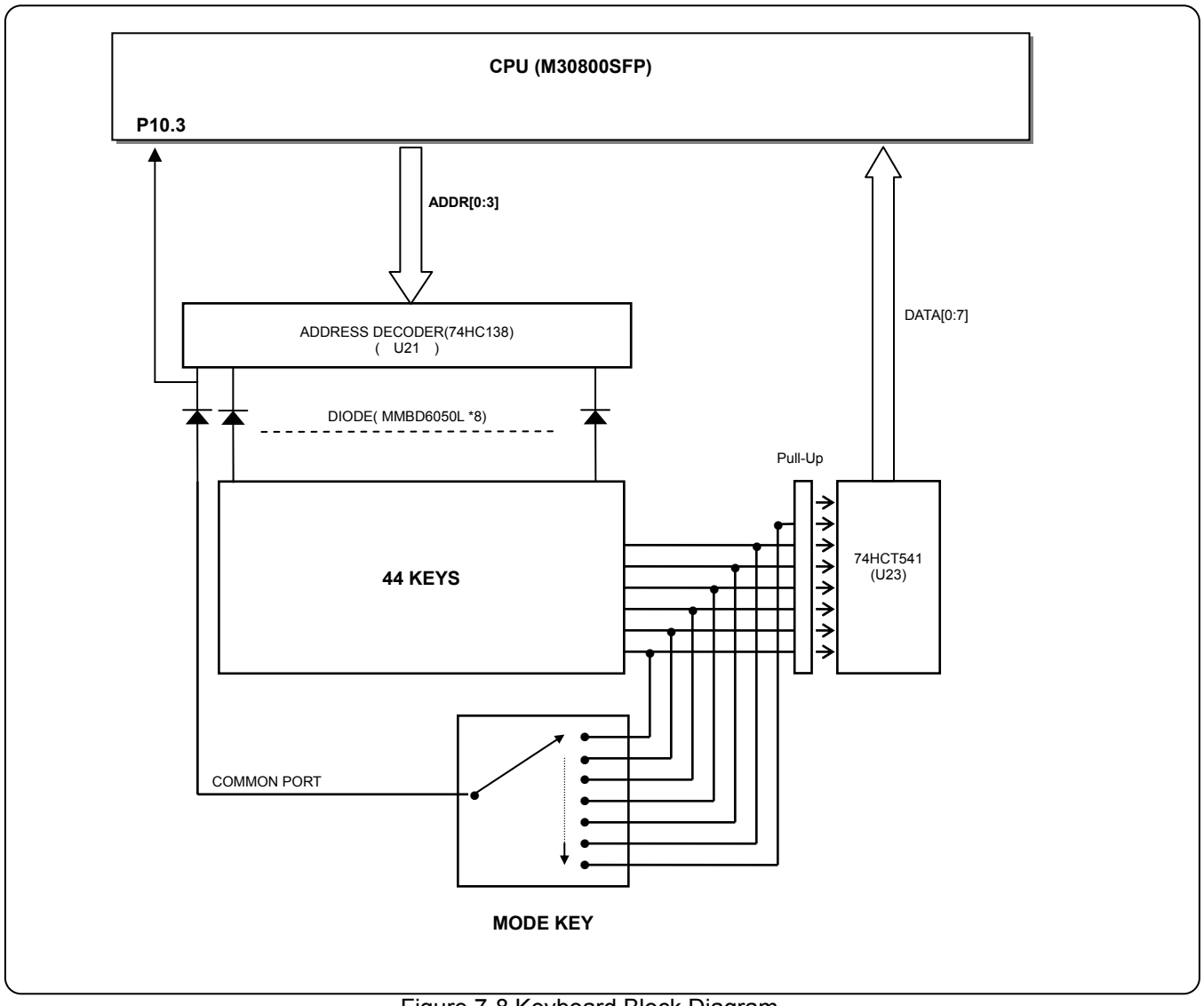


Figure 7-8 Keyboard Block Diagram

7-5 Thermal Printer Circuit

The operating method of the thermal printer is similar to the VFD operating method. First, the CPU send a Serial Clock and Serial Data 384Bits(48 Bytes) to the Thermal Printer. The Serial Data are stored to a Shift Register in the Thermal Printer. Second, the CPU send a Latch Signal to the Thermal Printer. Then, the Serial Data are stored to the Latch Register. After that, the CPU send a Strobe Signal to the Thermal Printer. Then, the Printer outputs the Serial Data. The Strobe Signals (STB1,STB2,STB3) are shorted each other on Main PBA (Same STB4,STB5,STB6). Each Strobe Signal manage the Printer Dot.

STB No.	DOT No.	DOTs/STB	ER-380 Strobe Processing
STB1	1 ~ 64	64	The STB1,STB2 and STB3 are shorted each other on Main PBA. (192 Dots)
STB2	65 ~ 128	64	
STB3	129 ~ 192	64	
STB4	193 ~ 256	64	The STB4,STB5 and STB6 are shorted each other on Main PBA. (192 Dots)
STB5	257 ~ 320	64	
STB6	321 ~ 384	64	

Table 7-2 Printer Head Strobe Processing

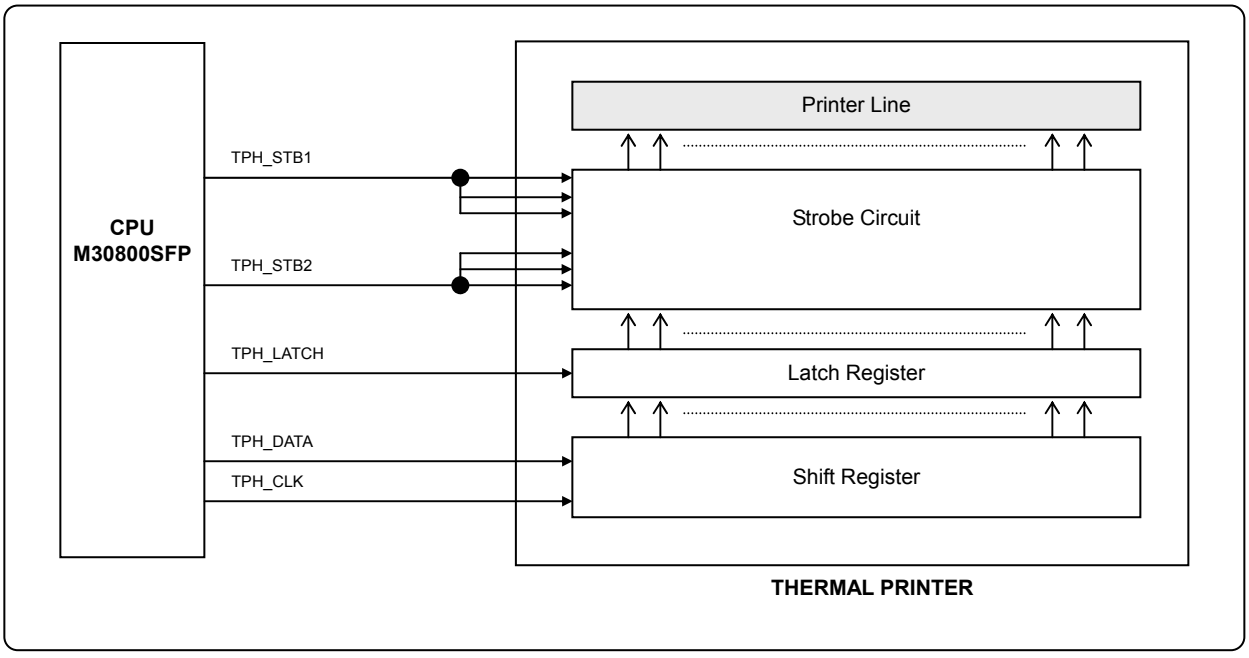


Figure 7-9 Thermal Printer Block Diagram

7-5 Thermal Printer Circuit

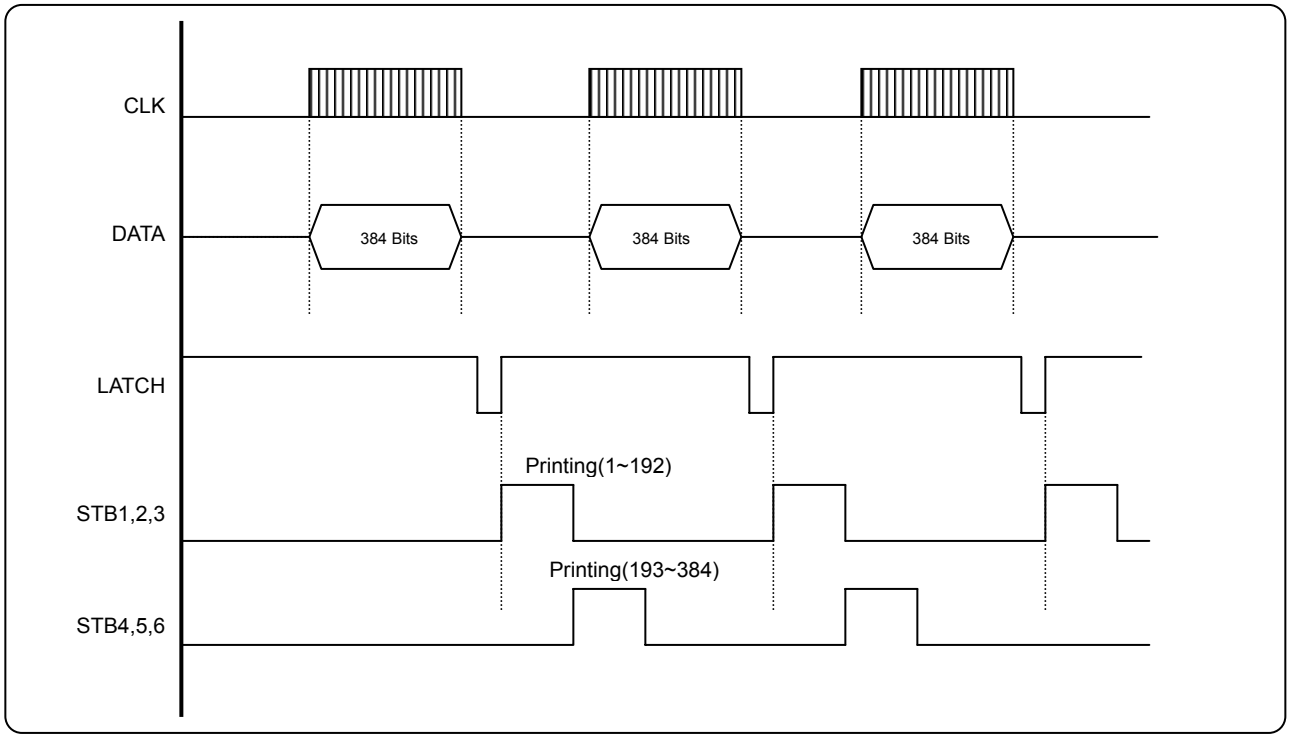
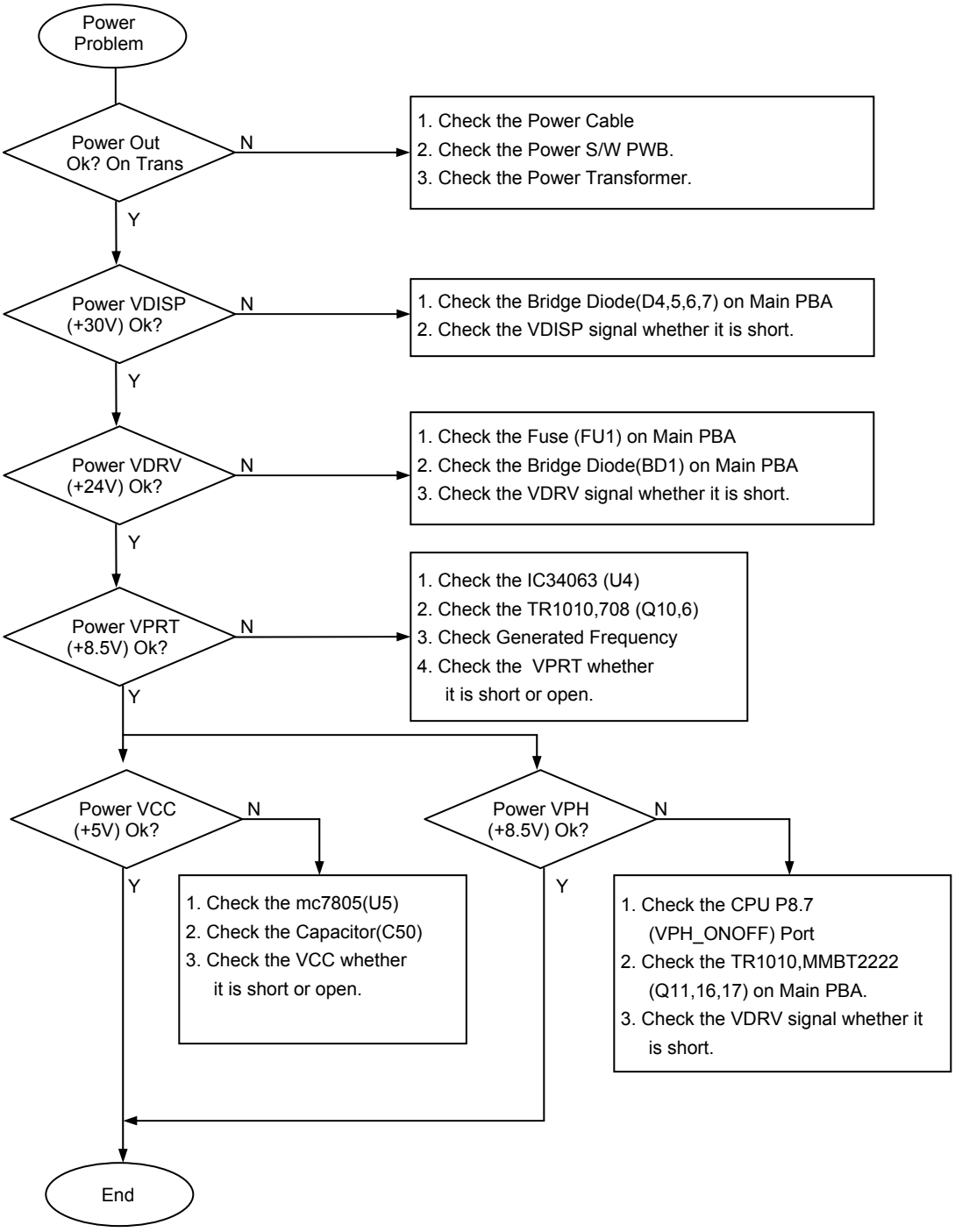


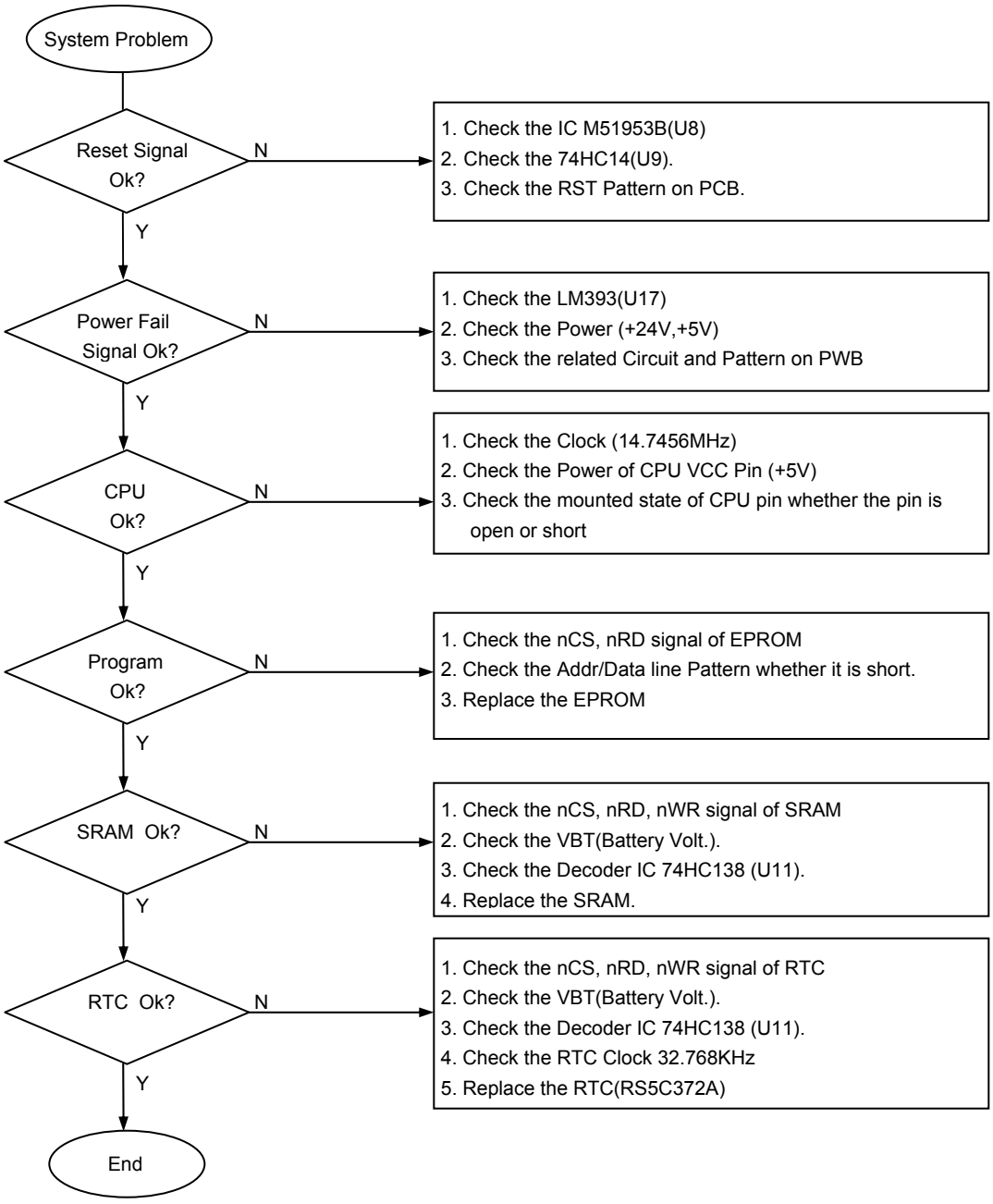
Figure 7-10 Thermal Printer Timing Waveform

8 Troubleshooting

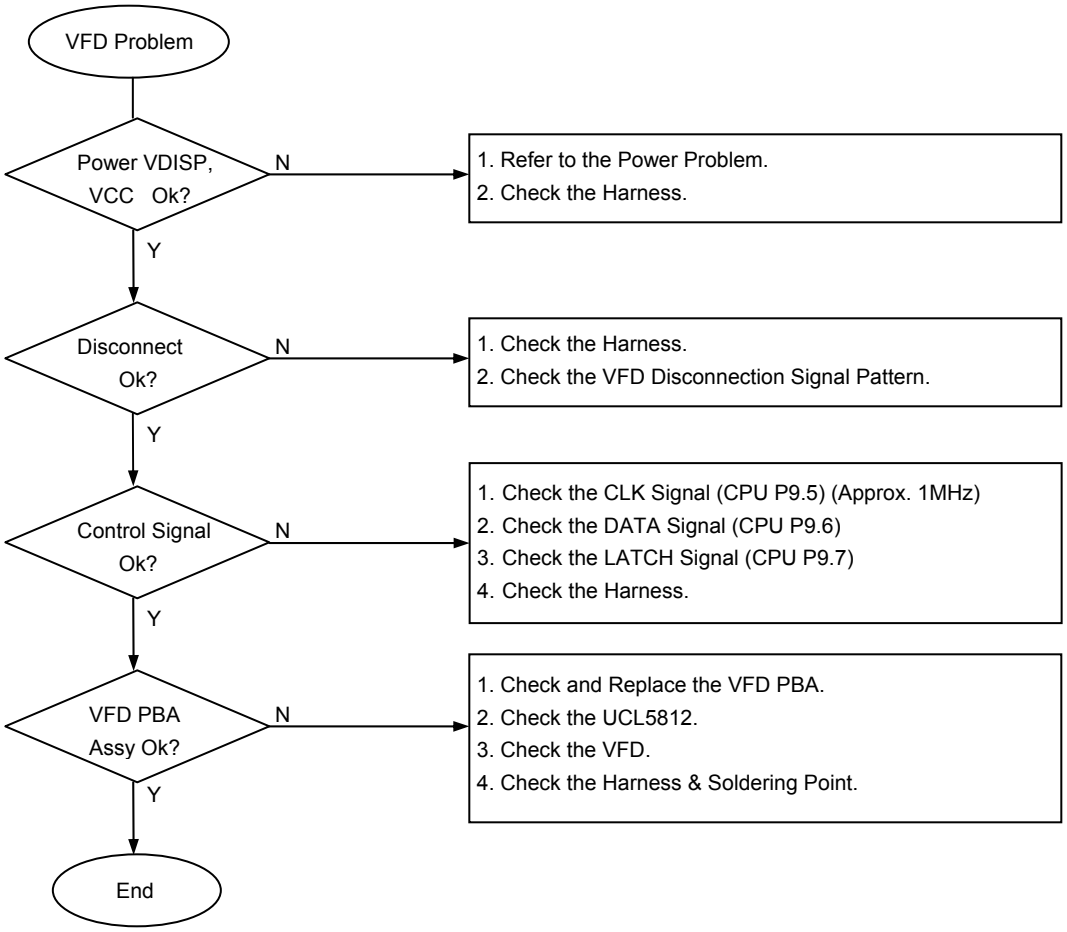
8-1. Power Problem


Power Problem
Power Out Ok? On Trans
N
1. Check the Power Cable
2. Check the Power S/W PWB.
3. Check the Power Transformer.
Y
Power VDISP (+30V) Ok?
N
1. Check the Bridge Diode(D4,5,6,7) on Main PBA
2. Check the VDISP signal whether it is short.
Y
Power VDRV (+24V) Ok?
N
1. Check the Fuse (FU1) on Main PBA
2. Check the Bridge Diode(BD1) on Main PBA
3. Check the VDRV signal whether it is short.
Y
Power VPRT (+8.5V) Ok?
N
1. Check the IC34063 (U4)
2. Check the TR1010,708 (Q10,6)
3. Check Generated Frequency
4. Check the VPRT whether it is short or open.
Y
Power VCC (+5V) Ok?
N
1. Check the mc7805(U5)
2. Check the Capacitor(C50)
3. Check the VCC whether it is short or open.
Y
Power VPH (+8.5V) Ok?
N
1. Check the CPU P8.7 (VPH_ONOFF) Port
2. Check the TR1010,MMBT2222 (Q11,16,17) on Main PBA.
3. Check the VDRV signal whether it is short.
Y
End

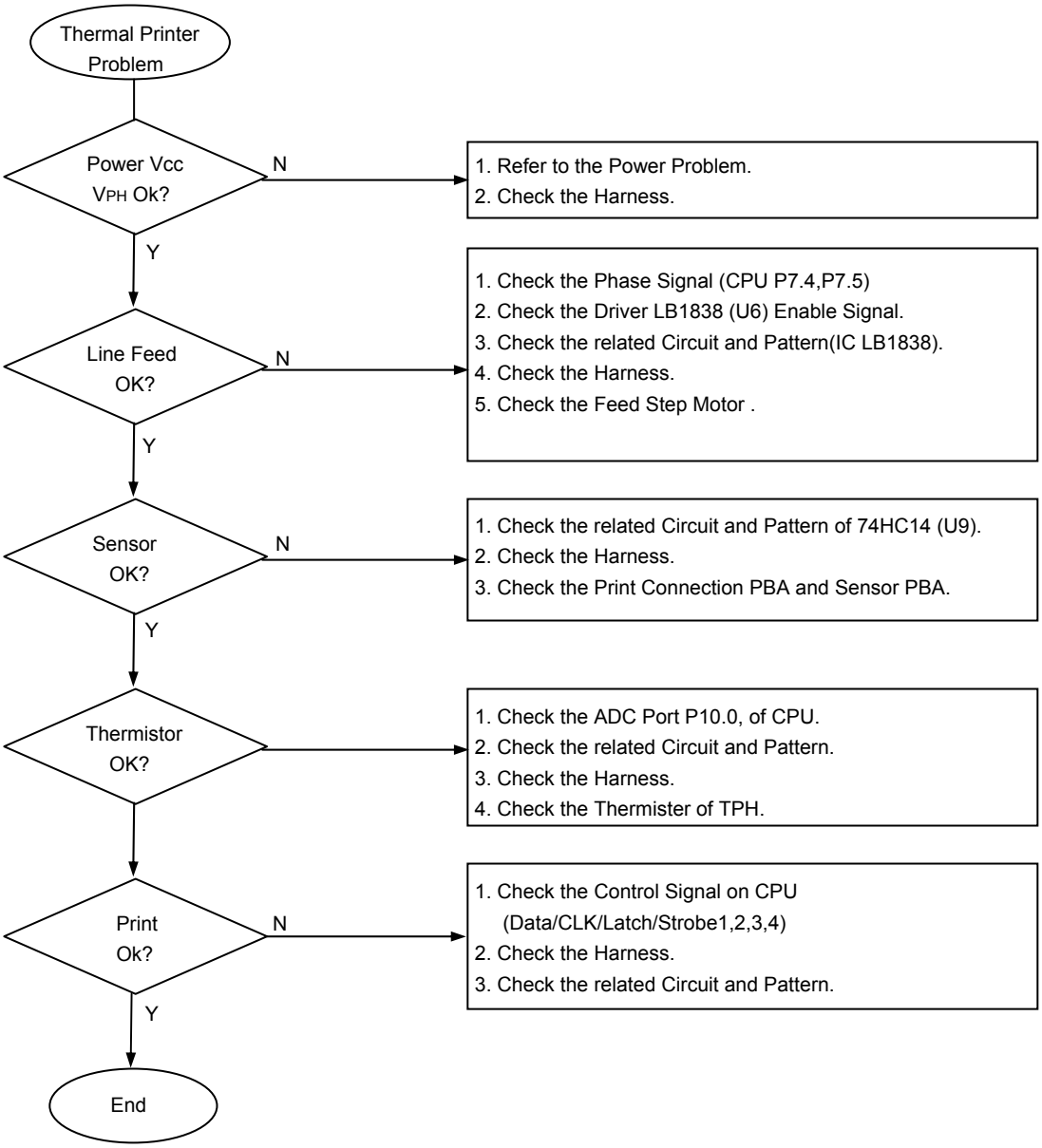
8-2 System Problem


System Problem
Reset Signal Ok?
N
1. Check the IC M51953B(U8)
2. Check the 74HC14(U9).
3. Check the RST Pattern on PCB.
Y
Power Fail Signal Ok?
N
1. Check the LM393(U17)
2. Check the Power (+24V,+5V)
3. Check the related Circuit and Pattern on PWB
Y
CPU Ok?
N
1. Check the Clock (14.7456MHz)
2. Check the Power of CPU VCC Pin (+5V)
3. Check the mounted state of CPU pin whether the pin is open or short
Y
Program Ok?
N
1. Check the nCS, nRD signal of EPROM
2. Check the Addr/Data line Pattern whether it is short.
3. Replace the EPROM
Y
SRAM Ok?
N
1. Check the nCS, nRD, nWR signal of SRAM
2. Check the VBT(Battery Volt.).
3. Check the Decoder IC 74HC138 (U11).
4. Replace the SRAM.
Y
RTC Ok?
N
1. Check the nCS, nRD, nWR signal of RTC
2. Check the VBT(Battery Volt.).
3. Check the Decoder IC 74HC138 (U11).
4. Check the RTC Clock 32.768KHz
5. Replace the RTC(RS5C372A)
Y
End

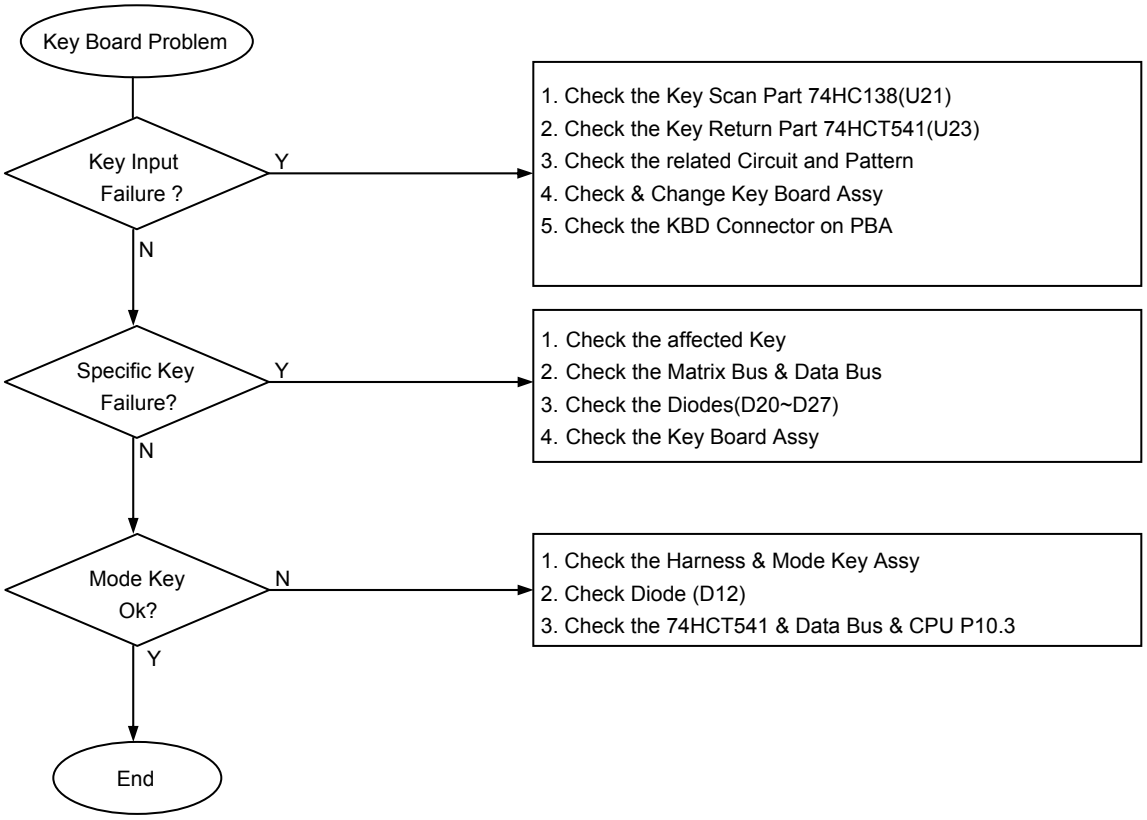
8-3 VFD Display Problem



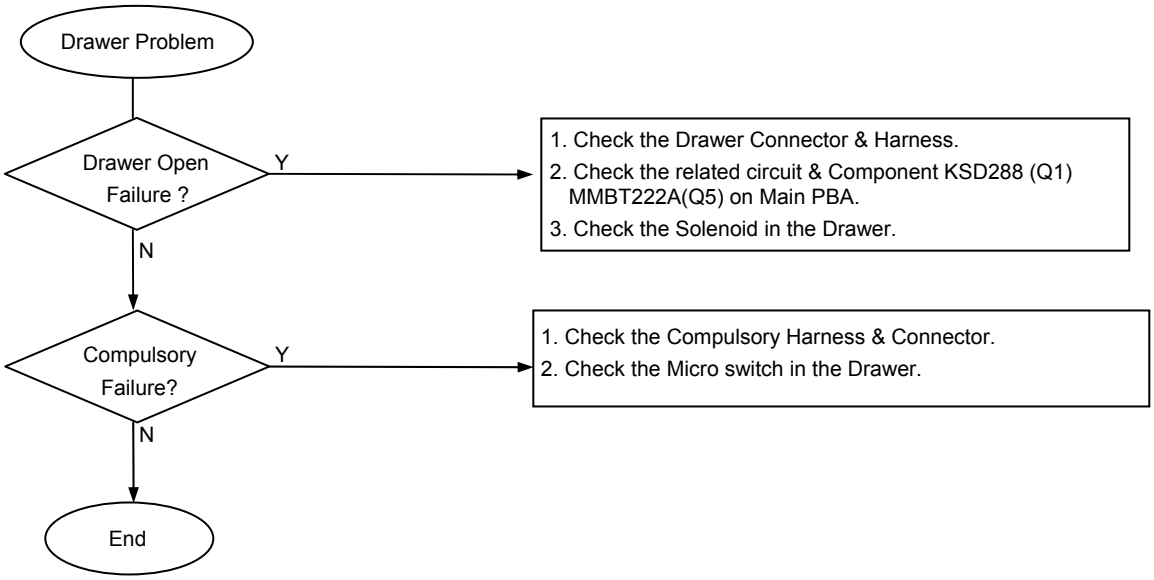
8-4 Thermal Printer Problem

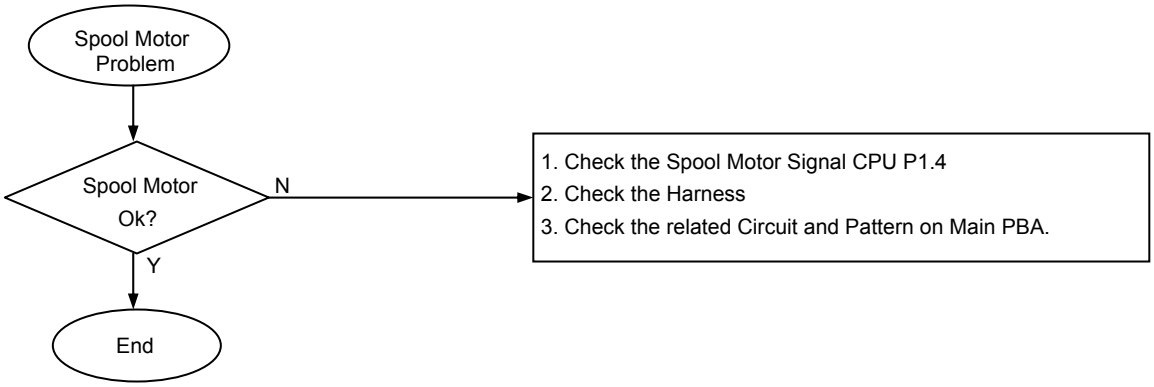

Thermal Printer Problem
Power Vcc VPH Ok?
N
1. Refer to the Power Problem.
2. Check the Harness.
Y
Line Feed OK?
N
1. Check the Phase Signal (CPU P7.4,P7.5)
2. Check the Driver LB1838 (U6) Enable Signal.
3. Check the related Circuit and Pattern(IC LB1838).
4. Check the Harness.
5. Check the Feed Step Motor .
Y
Sensor OK?
N
1. Check the related Circuit and Pattern of 74HC14 (U9).
2. Check the Harness.
3. Check the Print Connection PBA and Sensor PBA.
Y
Thermistor OK?
1. Check the ADC Port P10.0, of CPU.
2. Check the related Circuit and Pattern.
3. Check the Harness.
4. Check the Thermister of TPH.
Print Ok?
N
1. Check the Control Signal on CPU
(Data/CLK/Latch/Strobe1,2,3,4)
2. Check the Harness.
3. Check the related Circuit and Pattern.
Y
End

8-5 Key Board Problem

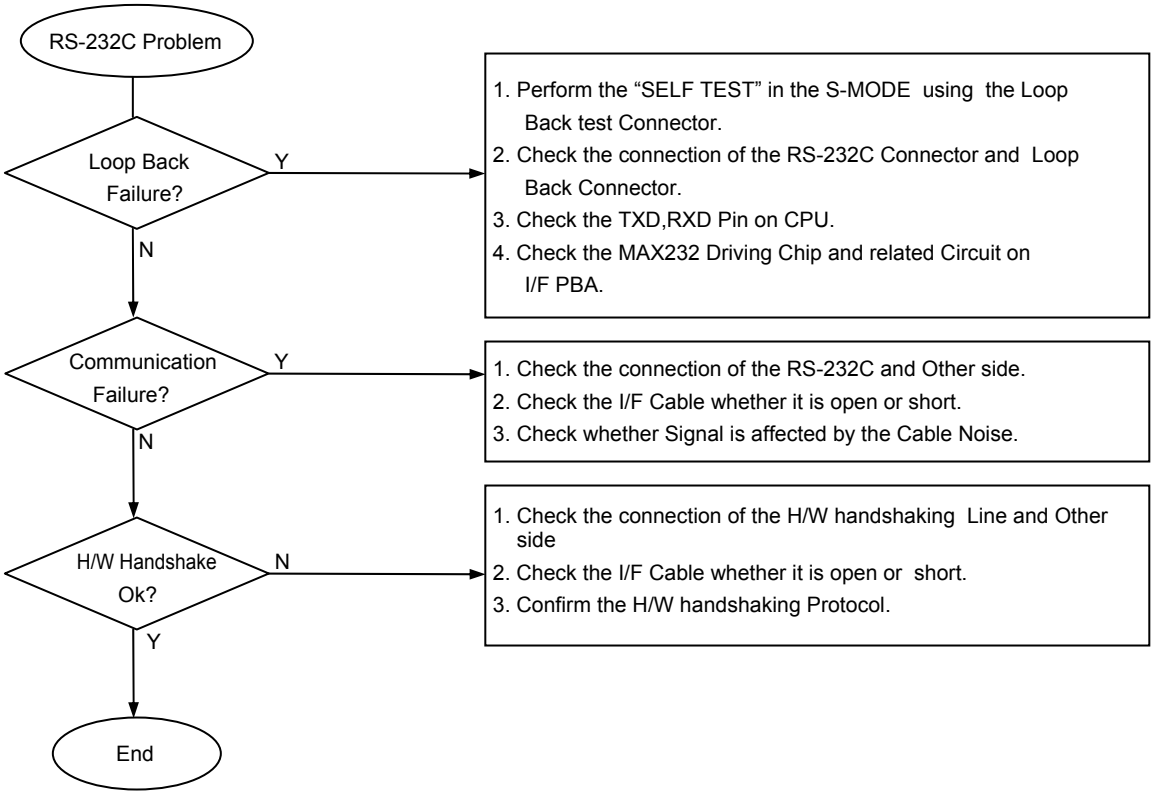

Key Board Problem
Key Input Failure ?
Y
N
1. Check the Key Scan Part 74HC138(U21)
2. Check the Key Return Part 74HCT541(U23)
3. Check the related Circuit and Pattern
4. Check & Change Key Board Assy
5. Check the KBD Connector on PBA
Specific Key Failure?
Y
N
1. Check the affected Key
2. Check the Matrix Bus & Data Bus
3. Check the Diodes(D20~D27)
4. Check the Key Board Assy
Mode Key Ok?
N
Y
1. Check the Harness & Mode Key Assy
2. Check Diode (D12)
3. Check the 74HCT541 & Data Bus & CPU P10.3
End

8-6 Drawer and Spool Motor Problem


Drawer Problem
Drawer Open Failure ?
Y
1. Check the Drawer Connector & Harness.
2. Check the related circuit & Component KSD288 (Q1) MMBT222A(Q5) on Main PBA.
3. Check the Solenoid in the Drawer.
N
Compulsory Failure?
Y
1. Check the Compulsory Harness & Connector.
2. Check the Micro switch in the Drawer.
N
End



8-7 RS-232C Serial Communication Problem


RS-232C Problem
Loop Back Failure?
Y
1. Perform the “SELF TEST” in the S-MODE using the Loop Back test Connector.
2. Check the connection of the RS-232C Connector and Loop Back Connector.
3. Check the TXD,RXD Pin on CPU.
4. Check the MAX232 Driving Chip and related Circuit on I/F PBA.
N
Communication Failure?
Y
1. Check the connection of the RS-232C and Other side.
2. Check the I/F Cable whether it is open or short.
3. Check whether Signal is affected by the Cable Noise.
N
H/W Handshake Ok?
N
1. Check the connection of the H/W handshaking Line and Other side
2. Check the I/F Cable whether it is open or short.
3. Confirm the H/W handshaking Protocol.
Y
End

MEMO

9 Exploded Views and Parts List

9-1 Main Set

9-1-1-1 Exploded View

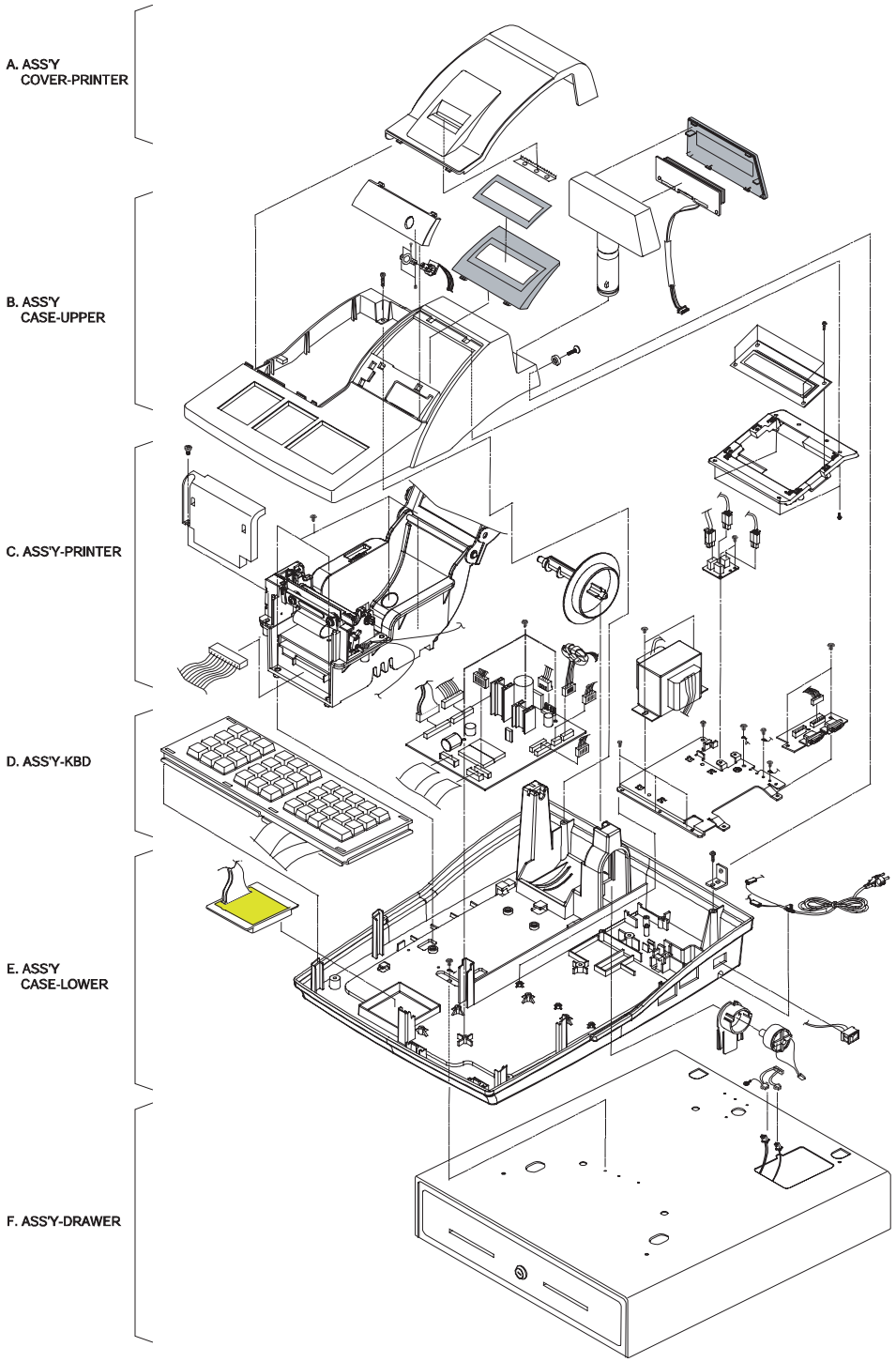


Figure9-1 Total Disassembly (ER-380M)

9-1-1-2 Exploded View

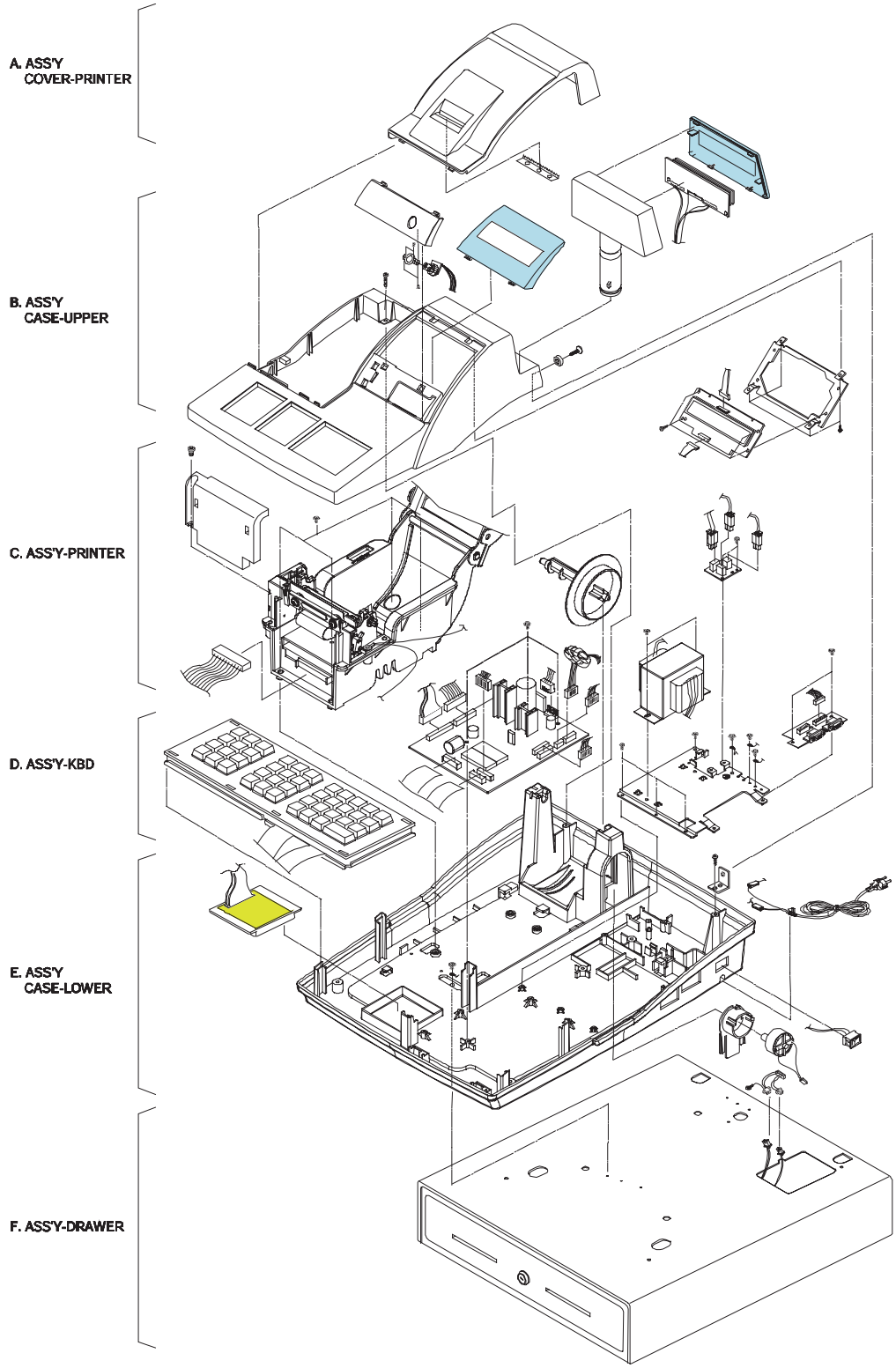
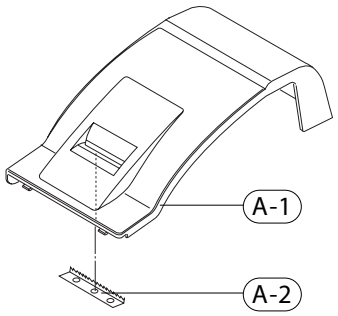
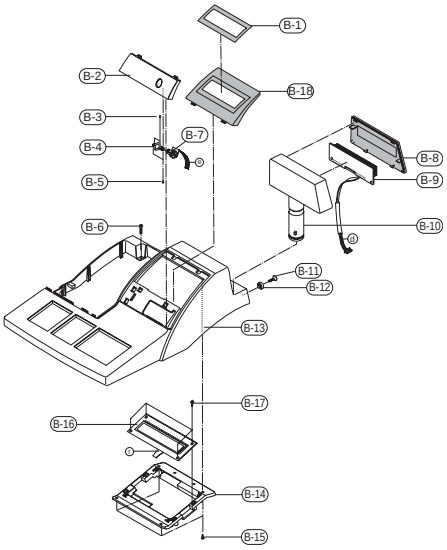


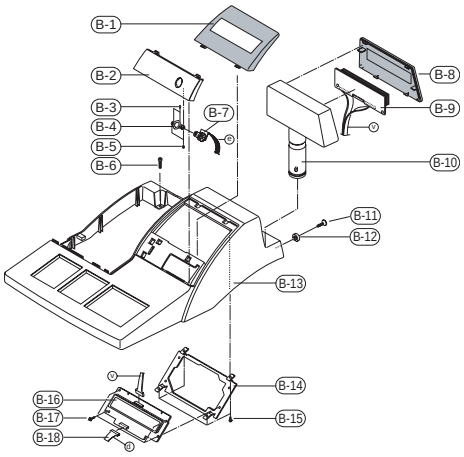
Figure9-2 Total Disassembly (ER-380F)

9-1 Main Set

9-1-2 Parts List







< ER-380M > < ER-380F >

Figure9-3 Cover Printer Assembly Figure9-4 Case Upper Assembly

9-1-2-(a) Cover Print Assembly

No.	Parts No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
A	JK97-20009A	MEA-COVER PRINTER: ER-380,STD	1		Y	
A-1	JK72-20062A	PMO-COVER PRINTER: HIPS(V0),IVORY	1		N	SAM4S
A-2	JK70-10320A	IPR-CUTTER PAPER: STS304,T0.3	1		N	

9-1-2-(b) Case Upper Assembly (ER-380M)

No.	Parts No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
B	JK94-01126A	PRA ETC-CASE-UPPER: ER-380M,STD	1		Y	
B-1	JK72-20091A	PMO-WINDOW LCD: ER-380M,ACRYL,T1.2	1		Y	
B-2	JK72-40207K	PMO-COVER MODE S/W: ER-380M,HIPS,IVR,V0	1		Y	ER-380M
B-3	6002-000319	SCREW-TAPPING: PH,+,2,M3,L8,ZPC(YEL)	2		Y	
B-4	JK70-10004A	IPR-BRKT MODE_S/W: SBHG-1,T1	1		Y	
B-5	6002-000319	SCREW-TAPPING: PH,+,2,M3,L8,ZPC(YEL)	2		Y	
B-6	6002-000172	SCREW-TAPPING: PH,+,2S,M4,L15	1		Y	
B-7	JK96-10044A	MODE KEY ASSY:ER-380,NO CORE,YH	1		Y	
B-8	JK72-40209B	PMO-WINDOW TURRET: PC	1		Y	
B-9	JK92-00970B	PBA SUB-TURRET:ER-450,WORLD,BASIC	1		Y	
B-10	JK72-00015A	PMO-TURRET BODY: HIPS(V0)	1		Y	
B-11	6001-000367	SCREW-MACHINE: FH,+,M4,L10	1		Y	
B-13	JK72-00012A	PMO-CASE UPPER: ER-380,STD	1		Y	
B-14	JK72-20110A	PMO-HOLDER DISPLAY:ER-380M,HIPS,V0,IVR	1		Y	
B-15	6002-000175	SCREW-TAPPING: PWH,+,2,M3,L8,ZPC(YEL)	4		Y	
B-16	JK07-00007A	LCD:16CHAR*2LINE,EDM1602-22,ER-5200M	1		Y	
B-17	6002-000175	SCREW-TAPPING: PWH,+,2,M3,L8,ZPC(YEL)	4		Y	
B-18	JK39-40630A	HARNESS-LCD:ER-380M	1		Y	

9-1-2-(b) Case Upper Assembly (ER-380F)

No.	Parts No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
B	JK94-01125A	PRA ETC-CASE-UPPER: ER-380F,STD	1		Y	
B-1	JK72-20063A	PMO-WINDOW DISPLAY:ER-380,PC,BLK	1		Y	
B-2	JK72-20064A	PMO-COVER MODE S/W:ER-380F,HIPS,IVR,V0	1		Y	ER-380F
B-3	6002-000319	SCREW-TAPPING: PH,+,2,M3,L8,ZPC(YEL)	2		Y	
B-4	JK70-10004A	IPR-BRKT MODE_S/W: SBHG-1,T1	1		Y	
B-5	6002-000319	SCREW-TAPPING: PH,+,2,M3,L8,ZPC(YEL)	2		Y	
B-6	6002-000172	SCREW-TAPPING: PH,+,2S,M4,L15	1		Y	
B-7	JK96-00956A	ELA ETC-MODEKEY ASSY: ER-380	1		Y	
B-8	JK72-40209B	PMO-WINDOW TURRET: PC	1		Y	
B-9	JK92-01231A	PBA SUB-TURRET: ER-380	1		Y	
B-10	JK72-00015A	PMO-TURRET BODY: HIPS(V0)	1		Y	
B-11	6001-000367	SCREW-MACHINE: FH,+,M4,L10	1		Y	
B-12	JK70-40305A	ICT-SHAFT MOLDING: SUM 24L,FISCAL	1		Y	
B-13	JK72-00012B	PMO-CASE UPPER: ER-380,FISCAL	1		Y	
B-14	JK70-10407A	IPR-BRKT WINDOW_PCB:ER-550,SECC,T1.2	1		Y	
B-15	6002-000175	SCREW-TAPPING: PWH,+,2,M3,L8,ZPC(YEL)	4		Y	
B-16	JK92-01242A	PBA SUB-380,DISPLAY: FUTABA,10G	1		Y	
B-17	6002-000175	SCREW-TAPPING: PWH,+,2,M3,L8,ZPC(YEL)	4		Y	
B-18	JK39-40002A	CBF HARNESS:ER-220N,-,UL1061,400MM,BLK/R	1		Y	

9-1 Main Set

9-1-2 Parts List

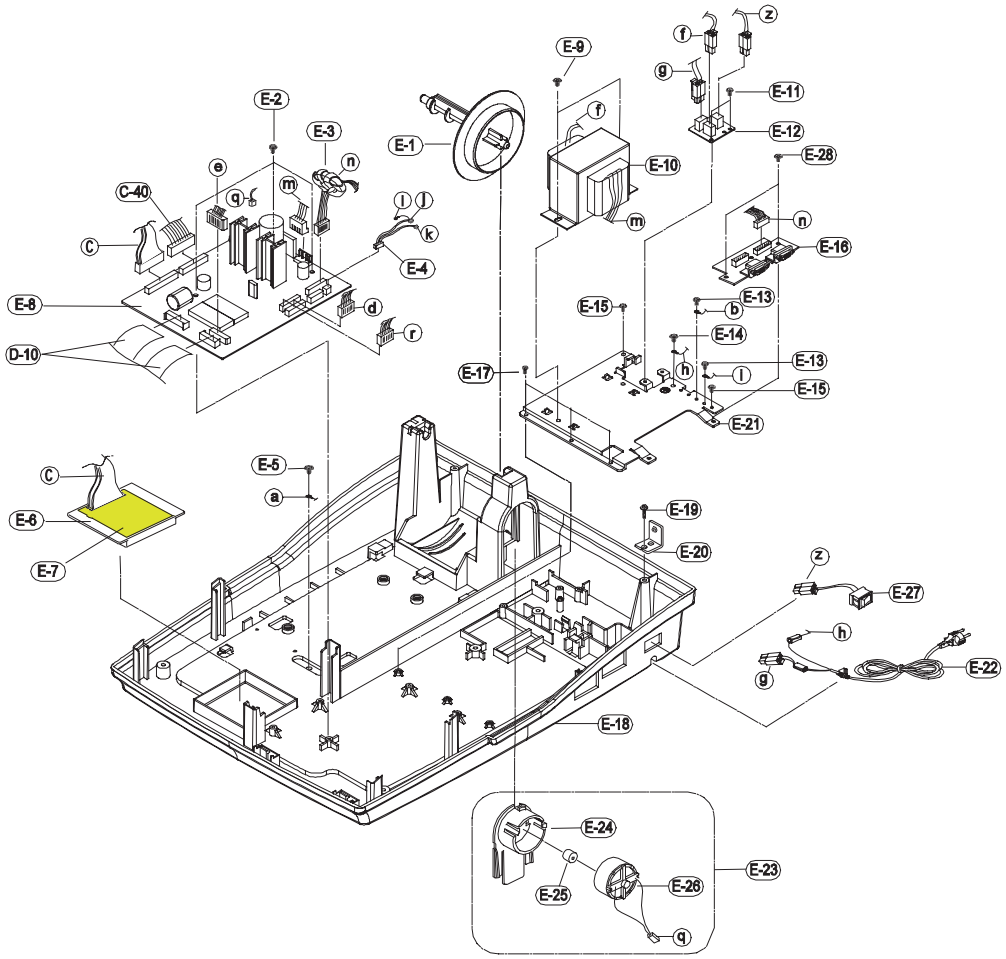


Figure9-5 Case Lower Assembly

9-1-2-(c) Case Lower Assembly

No.	Parts No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
E-1	JK72-40215A	PMO-PULLY WINDING: ABS(V0),BLK	1		Y	
E-2	6002-000174	SCREW-TAPPING: PWH,+,2,M3,L10,ZPC(YEL)	3		Y	
E-3	JK39-40642A	HARNESS-I/F:ER-380M,UL1061,#26,22P,200mm,CORE	1		Y	
E-4	JK39-40603A	HARNESS-DRA/COMP;ER-380,4P,180mm,PUR/BRN	1		Y	
E-5	6003-001149	SCREW-TAPTITE: PWH,+,S,M4,L10,ZPC(YEL),SR	1		Y	
E-6	JK72-40205A	PMO-CASE FISICAL BOARD: HIPS(V0)	1		Y	
E-7	JK92-00131A	PBA SUB-FISICAL B/D: 512K BYTE	1		Y	
	JK92-00983A	PBA MAIN-1M,FISICAL: 1M BYTE	1		Y	
E-8	JK92-01260A	PBA MAIN-BOARD:ER-380M,FISCAL	1		Y	
E-9	6006-000199	SCREW-ASS'Y TAPT:WT,BH,+,M4,L8,ZPC(YEL)	2		Y	
E-10	JK26-00013A	TRANS-POWER:USA: 120V 60Hz	1		Y	
	JK26-00012A	TRANS-POWER:EUROPE: 230V 50Hz	1		Y	
E-11	6002-000174	SCREW-TAPPING: PWH,+,2,M3,L10,ZPC(YEL)	2		Y	
E-12	JK92-01227C	PBA SUB-POWER SW: ER-380	1		Y	
E-13	JK60-00001A	SCREW-ASSY TAPTITE:-,SWRCH18A,M3,L8	2		Y	

9-1 Main Set

9-1-2 Parts List

9-1-2-(d) Case Lower Assembly

No.	Parts No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
E-14	6006-000199	SCREW-ASS'Y TAPT:WT,BH,+,M4,L8,ZPC(YEL)	1		Y	
E-15	6002-000174	SCREW-TAPPING:PWH,+,2,M3,L10,ZPC(YEL)	2		Y	
E-16	JK92-01280A	PBA SUB-I/F:ER-380/M,232*2	1		Y	
E-17	6003-000259	SCREW-TAPTITE:BH,+,B,M3,L8,ZPC(YEL),SWRC	3		Y	
E-18	JK72-00013C	PMO-CASE LOWER,S2:ER-380,HIPS	1		Y	
E-19	6002-000171	SCREW-TAPPING: PH,+,2S,M4,L10,ZPC(YEL)	1		Y	
E-20	JK70-10002A	IPR-BRKT CASING: ER-380,SBHG-1,T1.6,-	1		Y	
E-21	JK70-20018A	IPR-BRKT TRANS:ER-380,SECC T1.6	1		Y	
E-22	JK39-10002A	CBF-POWER CORD: AUSTRALIA	1		Y	
	JK39-10003A	CBF-POWER CORD: USA	1		Y	
	JK39-10008A	CBF-POWER CORD: UK	1		Y	
	JK39-10501A	CBF-POWER CORD: EUROPE	1		Y	
E-23	JK96-10035A	ELA-MOTOR ASS'Y: ER-380	1		Y	
E-24	JK72-40206A	PMO-HOLDER MOTOR: HIPS(V0)	1		Y	
E-25	JK73-30200A	RCT-MOTOR: URETANE,BLK	1		Y	
E-26	JK96-10036A	ELA ETC-MOTOR ASS'Y	1		Y	
	3101-001071	MOTOR-DC: 3270rpm,16g.cm,9V,130mA	1		N	
	JK39-40604A	HARNESS-SPOOL;ER-380,2P,400mm,NO CORE	1		N	
E-27	JK92-01227C	PBA SUB-POWER SW:ER-380	1		Y	
E-28	6001-000665	SCREW-MACHINE:PWH,+,M3,L4,ZPC(YEL)	2		Y	

9-2 Printer (STM-210)

9-2-1 Exploded View

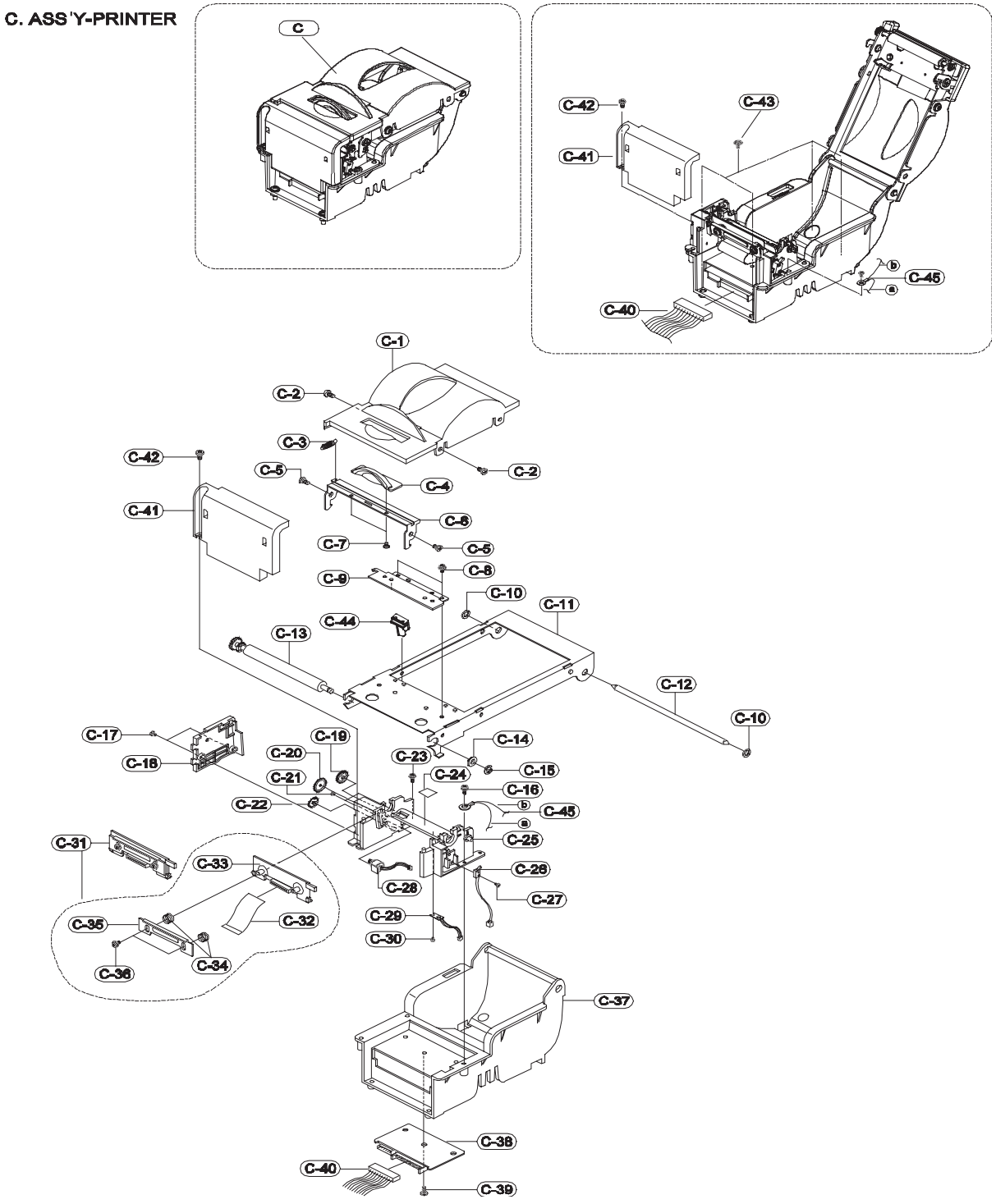


Figure9-6 Printer (STM-210)

9-2 Printer (STM-210)

9-2-1 Exploded View

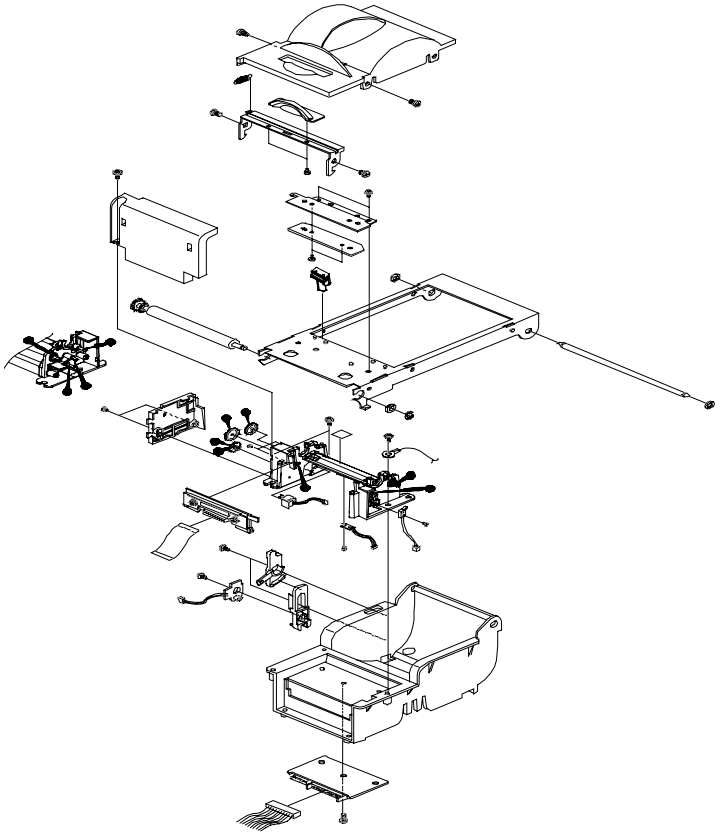


Figure9-7 Lubrication Points of the Printer (STM-210)

9-2-2 Parts List

No.	Parts No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
C	JK59-20001A	UNIT-PRINTER:STM-210	1		Y	
C-1	JK72-20001A	PMO-COVER TOP: HIPS(HB),IVORY	1		Y	
C-2	6001-000665	SCREW-MACHINE: PWH,+,2,M3,L4,ZPC(YEL)	2		Y	
C-3	JK70-30001A	SPRING-HOOK: SWP	1		Y	
C-4	JK72-20003A	PMO-CAP LEVER: HIPS(HB),BLUE	1		Y	
C-5	JK60-00003A	SCREW-SPECIAL: SUM 24L,WHITE	2		Y	
C-6	JK70-20003A	IPR-BRACKET HOOK: SECC T1.0	1		Y	
C-7	JK70-50011A	SCREW TAPPING: PH,+,2,M2,L4,WHITE	2		Y	
C-8	6001-000665	SCREW-MACHINE: PWH,+,2,M3,L4,ZPC(YEL)	2		Y	
C-9	JK70-20002A	IPR-FIXED CUTTER: SECC T1.2	1		Y	
C-10	JK70-50004A	POLY WASHER: Φ3.1,RED	2		Y	
C-11	JK70-20001A	IPR-COVER HOUSING: SECC T1.0	1		Y	
C-12	JK70-70001A	ICT-SHAFT HINGE: SUM	1		Y	
C-13	JK97-10002A	ASSY-PLATEN ROLLER: STM-210	1		Y	
C-14	JK70-50002A	ICT-BUSHING	1		Y	
C-15	JK70-50010A	E-RING: Φ2.0, T0.5	1		Y	
C-16	6002-000147	SCREW-TAPPING: PH,+,2,M3,L10,ZPC(YEL)	1		Y	
C-17	JK70-50009A	SCREW-MACHINE: RH,+,2,M2,L4,WHITE	2		Y	

9-2 Printer (STM-210)

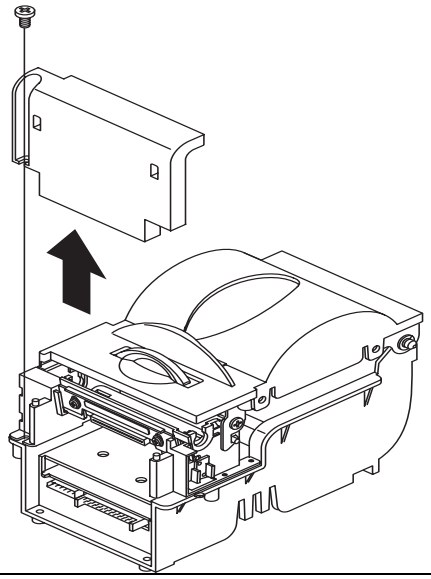
9-2-2 Parts List

No.	Parts No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
C-18	JK72-20005A	PMO-SIDE COVER: POM,BLK	1		Y	
C-19	JK72-20007A	PMO-GEAR REDUCTION 17_39: POM	1		Y	
C-20	JK72-20008A	PMO-GEAR REDUCTION 21_41: POM	1		Y	
C-21	JK70-50006A	SCREW-MACHINE: RH,+,2,M1.7,L2,WHITE	2		Y	
C-22	JK72-20006A	PMO-GEAR REDUCTION 13_43: POM	1		Y	
C-23	6002-000147	SCREW TAPPING: PH,+,2,M3,L10,ZPC(YEL)	1		Y	
C-24	JK68-40002A	LABEL(P)-WARNING HOT: ART-PAPER	1		Y	
C-25	JK70-20004A	IPR-MAIN FRAME	1		Y	
C-26	JK96-01233A	ELA-LEVER SENSOR	1		Y	
C-27	JK70-50007A	SCREW-MACHINE: RH,+,2,M1.7,L8,WHITE	1		Y	
C-28	JK59-40001A	MOTOR ASS'Y: STM-210	1		Y	
C-29	JK96-01231A	ELA-P/END SENSOR	1		Y	
C-30	JK70-50009A	SCREW-MACHINE: RH,+,2,M2,L4,WHITE	1		Y	
C-31	JK97-10004A	ASS'Y TPH: STM-210	1		Y	
C-32	JK39-40554A	CBF SIGNAL-PRINTER FFC: 21P,120MM	1		Y	
C-33	JK97-10004B	ASS'Y TPH,HEAT-SINK: STM-210	1		Y	
	JK47-10001A	TPH: ROHM	1		N	
	JK70-50005A	TPH TAPE: 3M	1		N	
	JK70-20006A	HEAT-SINK: ZNDC	1		N	
C-34	JK70-30002A	SPRING-TPH: SWP	2		Y	
C-35	JK70-20005A	IPR-BRACKET-REAR: SECC T1.0	1		Y	
C-36	6001-000665	SCREW-MACHINE: PWH,+,2,M3,L4,ZPC(YEL)	2		Y	
C-37	JK72-20002A	PMO-PAPER SUPPLY: ABS+GF 20%	1		Y	
C-38	JK92-01224A	PBA-SUB PRT CONN BOARD: STM-210	1		Y	
C-39	6002-000175	SCREW-TAPPING: PWH,+,2,M3,L8,ZPC(YEL)	1		Y	
C-40	JK39-00012A	CBF-HARNESS-KEY OPTION: 200mm	1		Y	
C-41	JK72-20009A	PMO-COVER FRONT: HIPS(HB);NON AUTO CUTTER	1		Y	
C-42	6002-000147	SCREW TAPPING: PH,+,2,M3,L10,ZPC(YEL)	1		Y	
C-43	6003-000198	SCREW TAPPING: PWH,+,2,M3,L12,ZPC(YEL)	4		Y	
C-44	JK72-20114A	PMO-SEPARATOR;STM-210,ABS+GF20%,BLACK	1		Y	
C-45	JK39-40021A	CBF HARNESS:ER-250F,-,UL1015,330/130,GRN	1		Y	C-45

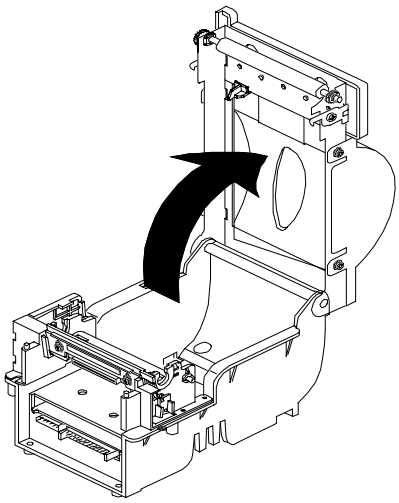
9-2 Printer (STM-210)

9-2-3 Thermal Printer Head assembly replacement

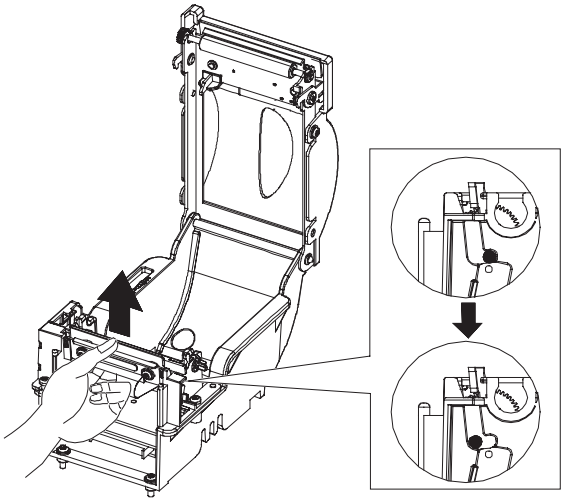
1.Unscrew the bolt of COVER FRONT and disassemble it from the PRINTER.



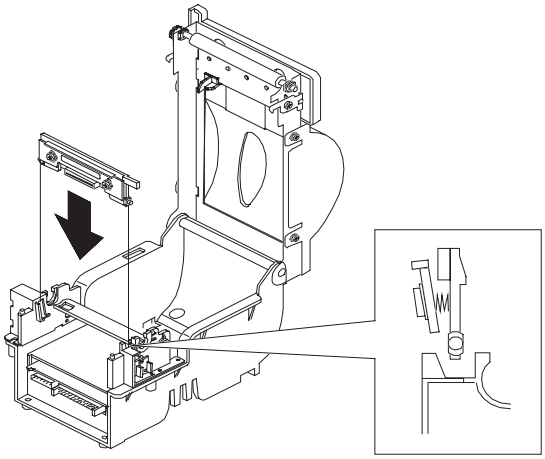
2. Open the COVER TOP.



3. Disassemble the TPH assembly by pulling the lower part of TPH assembly and lift it up.



4. Assemble the TPH assembly in reverse order and close the COVER TOP.



9-3 Key Board

9-3-1 Key Board (44Key)

9-3-1-(a) Exploded View

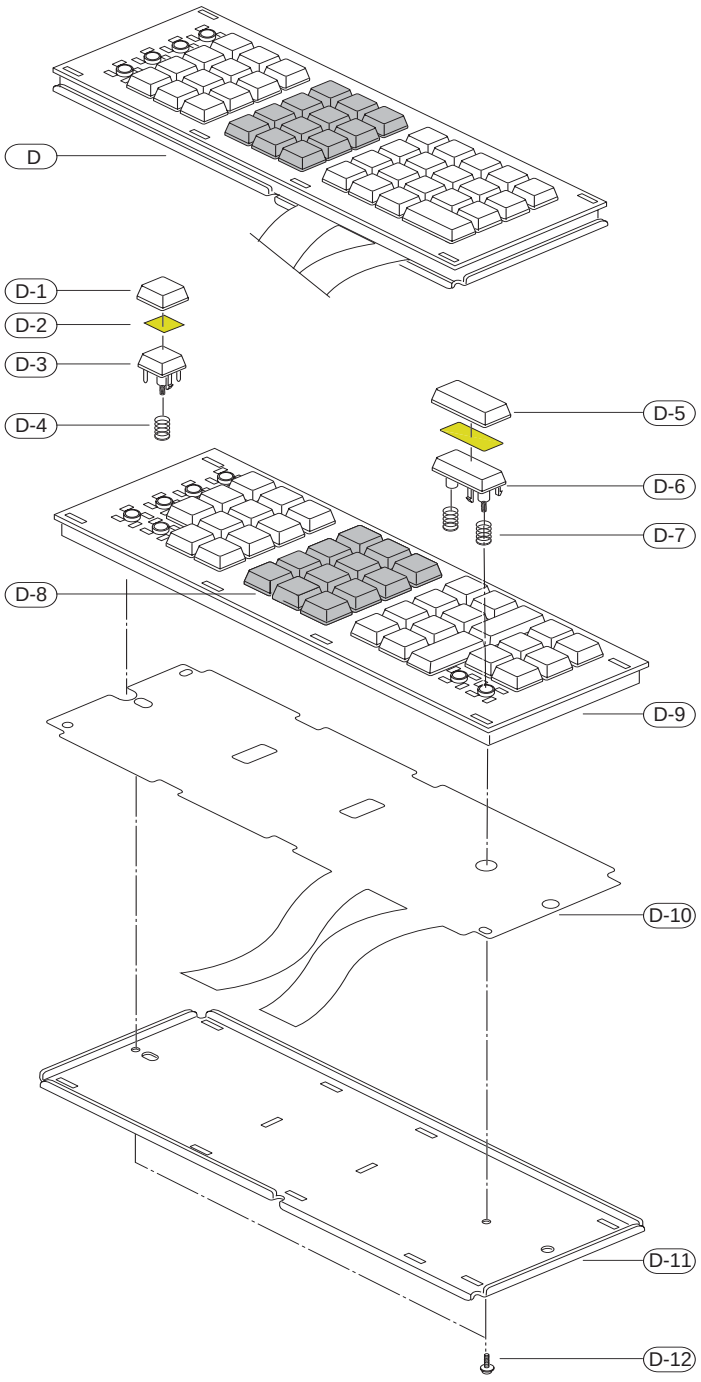


Figure9-8 Key Board (60 Key)

9-3 Key Board

9-3-1-(b) Parts List

No.	Parts No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
D	JK59-30011A	UNIT-KEYBOARD,STD:ENGLISH,44K,MEMBRANE	1		Y	
	JK59-30011B	UNIT-KEYBOARD,CRS:ENGLISH,44K,MEMBRANE	1		Y	
	JK59-30011C	UNIT-KEYBOARD,YCR:ENGLISH,44K,MEMBRANE	1		Y	
	JK59-30011D	UNIT-KEYBOARD,MUL:ENGLISH,44K,MEMBRANE	1		Y	
	JK59-30011E	UNIT-KEYBOARD,MIRA:ENGLISH,44K,MEMBRANE	1		Y	
D-1	JK81-10945A	KEY-CAP(S): 1X1	30		Y	
D-2	-	LABEL-KEY TOP SET: ER-380	1		N	
D-3	JK81-20013A	KEY-TOP ASS'Y(S): 1X1	30		Y	
D-4	JK81-10285T	SPRING RETURN: 1X1	42		Y	
D-5	JK81-10946A	KEY-CAP(L): 1X2	1		Y	
D-6	JK81-20014A	KEY-TOP ASS'Y(L): 1X2	1		Y	
D-7	JK81-20001A	SPRING-RETURN: 1X2	2		Y	
D-8	JK81-10933A	KEY-TOP,1	1		Y	
	JK81-10934A	KEY-TOP,2	1		Y	
	JK81-10935A	KEY-TOP,3	1		Y	
	JK81-10936A	KEY-TOP,4	1		Y	
	JK81-10937A	KEY-TOP,5	1		Y	
	JK81-10938A	KEY-TOP,6	1		Y	
	JK81-10939A	KEY-TOP,7	1		Y	
	JK81-10940A	KEY-TOP,8	1		Y	
	JK81-10941A	KEY-TOP,9	1		Y	
	JK81-10942A	KEY-TOP,0	1		Y	
	JK81-10943A	KEY-TOP,00	1		Y	
	JK81-10944A	KEY-TOP,●	1		Y	
D-9	JK72-60448A	HOUSING	1		Y	
D-10	JK81-10949A	FPC ASS'Y	1		Y	
D-11	JK70-10422A	FRAME(T0.8)	1		Y	
D-12	6002-000114	SCREW TAPPING: PH,+,2,M3,L8,ZPC(YEL)	2		Y	

9-5 Drawer

9-5-1 Exploded View

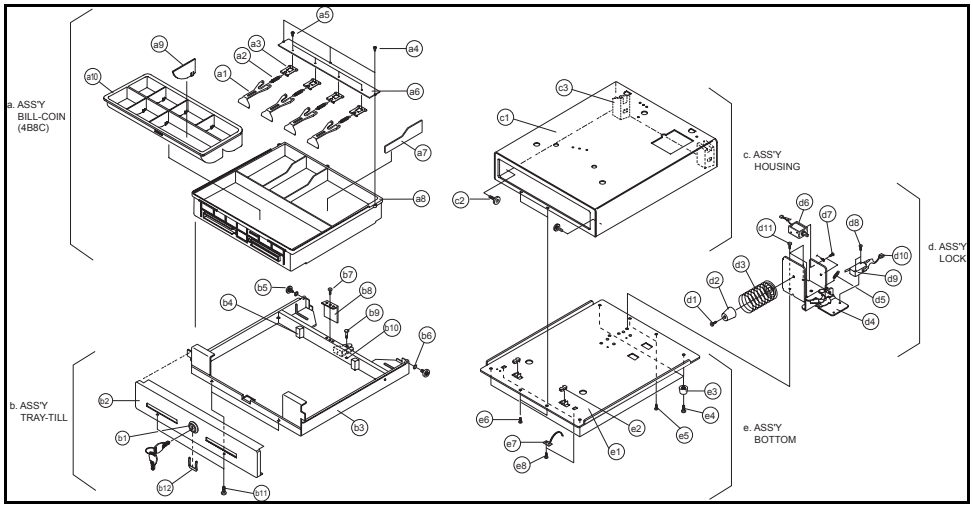


Figure9-13 Drawer (4B/8C)

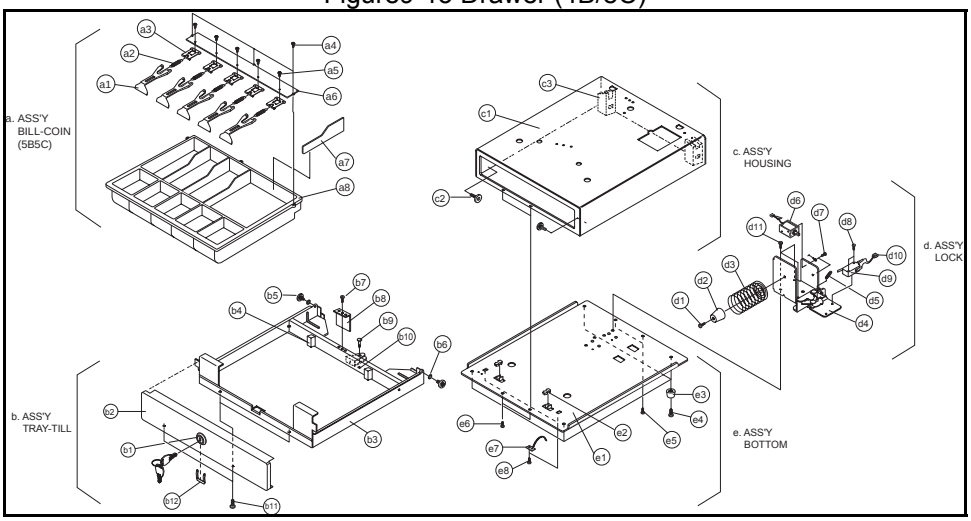


Figure9-14 Drawer (5B/5C)

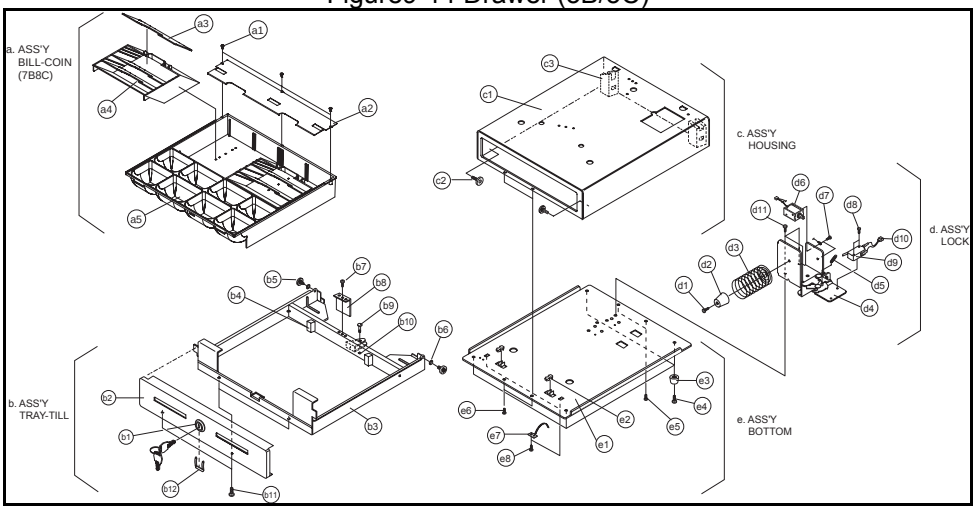


Figure9-15 Drawer (7B/8C)

9-5 Drawer

9-5-2 Parts List

9-5-2-(a) ASS'Y BILL-COIN (4B/8C, 5B/5C)

No.	Code No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
a	JK97-20014A	MEA-UNIT BILL COIN: A-TYPE, 4B8C	1		Y	
	JK97-00407A	MEA-UNIT BILL COIN: A-TYPE, 5B5C	1		Y	
a-1	JK72-40267A	PMO-LEVER PRESS: A-TYPE,POM	4		Y	
a-2	6107-000134	SPRING ES: SUS304	4		Y	
a-3	JK70-10314A	IPR-HOLDER LEVER: A-TYPE,T1.2,ZPC	4		Y	
a-4	6002-000175	SCREW-TAPPING: PWH,+2,M3,L8,ZPC(YEL)	3		Y	
a-5	6002-001078	SCREW-TAPPING: PWH,+2,M3,L5	4		Y	
a-6	JK70-10304A	IPR-PLATE HOLDER: A-TYPE,SBHG-1,T1.2	1		Y	
a-7	JK72-40269A	PMO-PANEL PARTITION: A-TYPE,HIPS,BLK	3		Y	
a-8	JK72-20088A	PMO-BILL COIN TILL: A-TYPE,4B8C,HIPS,BLK	1		Y	
	JK72-40268A	PMO-BILL COIN TILL: A-TYPE,5B5C,HIPS,BLK	1		Y	
a-9	JK72-20090A	PMO-COIN PARTITION: A-TYPE,4B8C	6		Y	
a-10	JK72-20089A	PMO-COIN TILL: A-TYPE,4B8C,-	1		Y	

9-5-2-(a) ASS'Y BILL-COIN (7B/8C)

No.	Code No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
a	JK97-01103A	MEA-UNIT BILL COIN: A-TYPE, 7B8C	1		Y	
a-1	6002-000175	SCREW-TAPPING: PWH,+2,M3,L8,ZPC(YEL)	3		Y	
a-2	JK70-00068A	IPR-HOLDER PLATE: A-TYPE,SBHG-1, T1.2	1		Y	
a-3	JK72-00083A	PMO-BILL PARTITION: A-TYPE,HIPS,BLK	5		Y	
a-4	JK72-00082A	PMO-BILL TILL: A-TYPE,HIPS,BLK	2		Y	
a-5	JK72-00084A	PMO-BILL COIN TILL: A-TYPE,HIPS,BLK	1		Y	

9-5-2-(b) ASS'Y TRAY-TILL

No.	Code No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
b	JK97-01073B	MEA-UNIT TRAY TILL: A-TYPE,5B5C	1		N	
	JK97-01073D	MEA-UNIT TRAY TILL: A-TYPE,4B8C,7B8C(EURO)	1		N	
b-1	JK75-10389A	MEC-LOCK: DRAWER	1		Y	
b-2	JK70-10014A	IPR-PLATE FRONT: A-TYPE,SBC-1,T1.0	1		Y	
	JK70-10014B	IPR-PLATE FRONT: A-TYPE,4B8C,7B8C	1		Y	
b-3	JK75-00025A	MEA-TRAY TILL: A-TYPE,4B8C,7B8C	1		N	
	JK75-00025B	MEA-TRAY TILL: A-TYPE,5B5C	1		N	
b-4	JK73-10203A	RPR-TENSION: DRAWER,SPONGE,BLK	2		N	
b-5	JK75-10386A	MEC-ROLLER: DRAWER,DR-10-B1/ Φ19	2		Y	
b-6	6031-000549	WASHER-PLAIN: IDΦ6.5,ODΦ13, T1.0	2		Y	
b-7	6003-000221	SCREW-TAPTITE: PWH,+2,M4,L8,ZPC(YEL)	1		Y	
b-8	JK70-10324A	IPR-SUPPORT TRAY: DRAWER,SBHG-1,T1.2	1		N	
b-9	JK70-40302A	ICT,SHAFT PIN: A-TYPE	1		N	
b-10	6044-000124	RING-E: IDΦ3,ODΦ7, T0.6,ZPC(BLK),STSC	1		Y	
b-11	6002-001042	SCREW-TAPPING: FH,+2,M3,L6	2		Y	
b-12	JK70-10323A	IPR-PLATE CLIP: DRAWER,SWP,T0.5	1		Y	

9-5 Drawer

9-5-2 Parts List

9-5-2-(c) ASS'Y HOUSING

No.	Code No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
c	JK97-01074A	MEA-COVER HOUSING: A-TYPE,BASIC	1		N	
	JK97-01074B	MEA-COVER HOUSING: A-TYPE,NONE HOLE,OPTION	1		N	
c-1	JK75-00026A	MEA-SUB HOUSING: A-TYPE,BASIC	1		N	
	JK75-00026B	MEA-SUB HOUSING: A-TYPE,NONE HOLE,OPTION	1		N	
c-2	JK75-10386A	MEC-ROLLER: DRAWER,DR-10-B1/ Φ19	2		N	
c-3	JK73-20207A	REX-PAD DRAWER: DRAWER,NR,BLK	2		N	

9-5-2-(d) ASS'Y LOCK

No.	Code No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
d	JK97-00985A	MEA-UNIT LOCK: A-TYPE,2-LATCH,LONG LEVER	1		Y	
	JK97-00987A	MEA-UNIT LOCK: A-TYPE,2-LATCH,SHORT LEVER	1		Y	
d-1	6002-000157	SCREW-TAPPING: PH,+2,M4,L14,ZPC(YEL)	1		Y	
d-2	JK73-20210A	REX-BUMPER: DRAWER,NR,BLK	1		Y	
d-3	JK61-70100A	SPRING-PUSH: DRAWER,FZN	1		Y	
d-4	JK75-00027A	MEC-LOCK LEVER: A-TYPE,2-LATCH,LONG LEVER	1		N	
	JK75-00027B	MEC-LOCK LEVER: A-TYPE,2-LATCH,SHORT LEVER	1		N	
d-5	6107-001014	SPRING-ES: Φ0.4,D4.8,L18	1		Y	
d-6	JK33-10500A	SOLENOID-DC: A-DRAWER	1		Y	
d-7	6001-000131	SCREW-MACHINE: BH,+2,M3,L6,ZPC(YEL)	2		Y	
d-8	6001-000525	SCREW-MACHINE: PH,+2,M3,L14,ZPC(YEL)	2		Y	
d-9	3405-001013	SWITCH-MICRO: 125V,5A	1		Y	
d-10	JK39-40301R	CBF-HARNESS: 2P,150MM,BRN,1007	1		Y	
d-11	6002-000161	SCREW-TAPPING: PH,+2,M4,L8,ZPC(YEL)	3		Y	

9-5-2-(e) ASS'Y BOTTOM

No.	Code No.	Description / Specification	Q`ty	Design-Location	Serviceable	Remark
e	JK97-01976A	MEA-UNIT BOTTOM: A-TYPE	1		N	
	JK97-01076B	MEA-UNIT BOTTOM: A-TYPE,UNIVERSAL	1		N	
e-1	JK70-10938A	IPR-PLATE BOTTOM: A-TYPE,SBHG-1,T1.0	1		N	
e-2	JK73-40200A	RMO-STOPPER: DRAWER,NR,BLK	2		N	
	JK73-10902A	RMO-STOPPER: DRAWER,NR,BLK,UNIVERSAL	2		N	
e-3	JK61-40200A	RMO-FOOT RUBBER: DRAWER,NR,GRAY,80HB	4		Y	
e-4	6002-000234	SCREW-TAPPING: TH,+2,M4,L16,ZPC(YEL)	4		Y	
e-5	6003-000267	SCREW-TAPTITE: PWH,+2,M3,L8,ZPC(YEL)	6		Y	
e-6	6003-000267	SCREW-TAPTITE: PWH,+2,M3,L8,ZPC(YEL)	2		Y	
e-7	JK70-10401A	IPR-PLATE SPRING: DRAWER,STS304,T0.3	2		Y	
e-8	6003-000267	SCREW-TAPTITE: PWH,+2,M3,L8,ZPC(YEL)	4		Y	

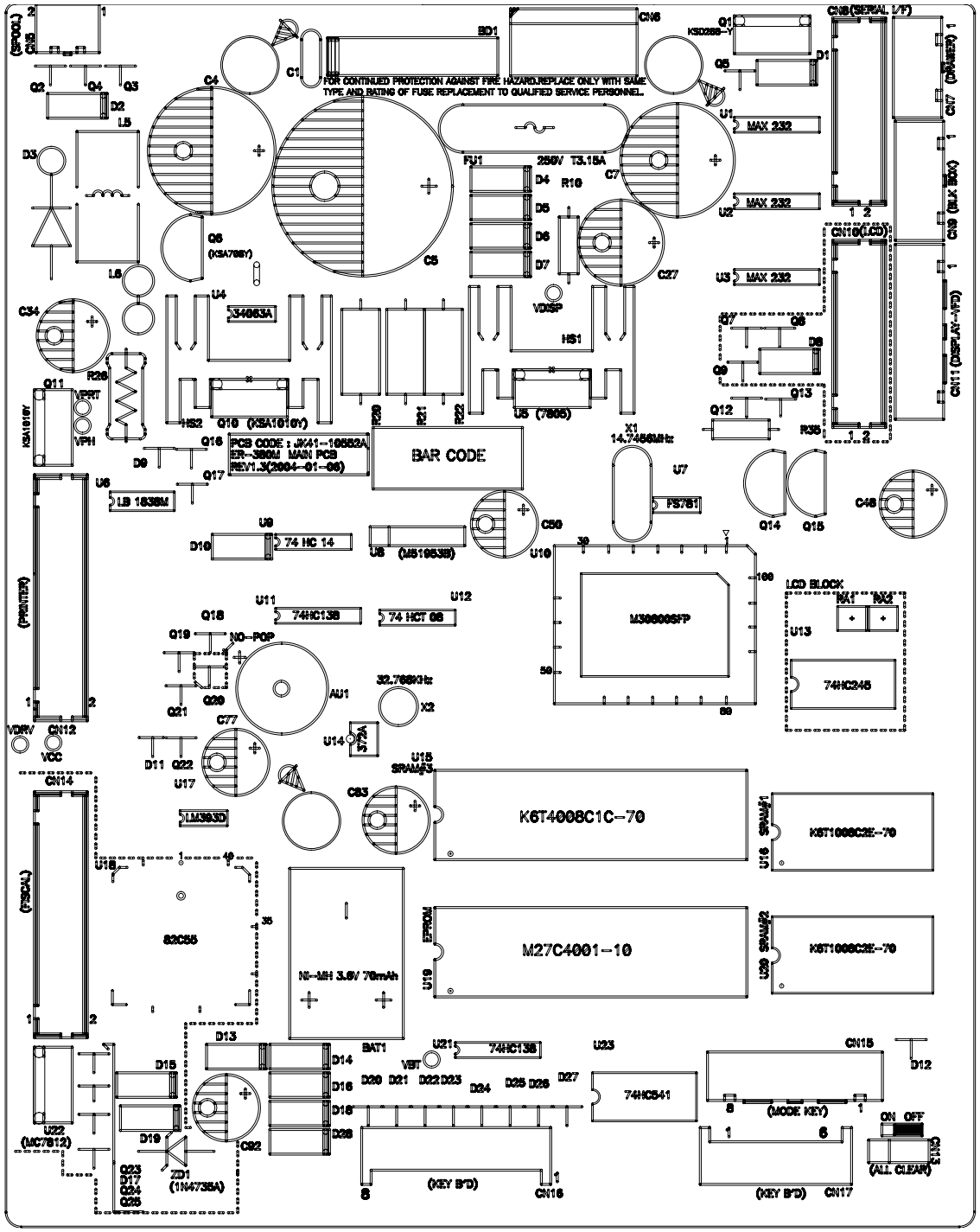
MEMO

10 PCB Layout and Parts List

10-1 Main PCB Layout

10-1-1 MAIN PCB (PCB:JK41-10552A)

10-1-1-(a) Component Side View



10-1 Main PCB Layout

10-1-1-(b) Parts List

No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	JK92-01260A	PBA MAIN-BOARD:ER-380M,FISCAL	1			
-	0202-000216	SOLDER-BAR:S63S-B20,S63S,350X34,SN63/PB3	1			
-	0202-001025	SOLDER-WIRE FLUX:KS-611,-,-,-,spray	1			
-	0204-000469	THINNER:#4662,-,0.795,-	1			
-	0201-000008	ADHESIVE-HM:#3748,WHT,6500CPS,V2	1	X1,X2,L5,		
-	0402-000168	DIODE-RECTIFIER:1N5822,40V,3A,DO-201AD,T	1	D3		
-	0402-000290	DIODE-BRIDGE:KBU6B,100V,6A,-,BK	1	BD1		
-	0403-000141	DIODE-ZENER:1N4735A,6.2V,5%,1W,DO-41,TP	1	ZD1		
-	0501-000294	TR-SMALL SIGNAL:KSA708-Y,PNP,800mW,TO-92	1	Q6		
-	0501-000294	TR-SMALL SIGNAL:KSA708-Y,PNP,800mW,TO-92	1	Q14		
-	0501-000294	TR-SMALL SIGNAL:KSA708-Y,PNP,800mW,TO-92	1	Q15		
-	0502-000234	TR-POWER:KSA1010Y,PNP,40W,TO-220,TP,100	1	Q11		
-	0502-000288	TR-POWER:KSD288,NPN,25W,TO-220,-,120-24	1	Q1		
-	1102-000161	IC-EPROM:27C040,512Kx8BIT,DIP,32P,600MI	1	U19		
-	JC68-10564A	LABEL(P)-PROTECTOR:SLB-3108H,ART,-,100(S	1	U19		
-	1106-000245	IC-SRAM:684000,512Kx8BIT,DIP,32P,600MI	1	U15		
-	1203-000442	IC-POSI.FIXED REG.:7812,TO-220,3P,-,PLAS	1	U22		
-	1209-001089	IC-DETECTOR:M51953B,SIP,5P,-,PLASTIC,18V	1	U8		
-	2001-000027	R-CARBON:100OHM,5%,1/4W,AA,TP,2.4X6.4MM	1	R10		
-	2001-001291	R-CARBON: 1OHM,5%,1/2W,AA,TP,3.5X9.5MM	1	R35		
-	2003-000502	R-METAL OXIDE(S):150ohm,5%,2W,AA,TP,4x12	1	R26		
-	2005-001001	R-WIRE WOUND:0.1ohm,5%,1W,AA,TP,3.3x9mm	1	R20		
-	2005-001001	R-WIRE WOUND:0.1ohm,5%,1W,AA,TP,3.3x9mm	1	R21		
-	2005-001001	R-WIRE WOUND:0.1ohm,5%,1W,AA,TP,3.3x9mm	1	R22		
-	2301-000010	C-FILM,PEF:100nF,5%,100V,TP,11.5x12.5mm,	1	C1		
-	2401-000032	C-AL:100uF,20%,50V,GP,TP,8x12,5mm	1	C27		
-	2401-000042	C-AL:100uF,20%,16V,GP,TP,6.3x7,5	1	C48,C50,C83,C92		
-	2401-000603	C-AL:1uF,20%,50V,GP,TP,5x11,5	1	C77		
-	2401-001312	C-AL:4700uF,20%,50V,GP,BK,22x40,10	1	C5		
-	2401-001363	C-AL:470uF,20%,16V,GP,TP,10x12.5,5	1	C34		
-	2401-001429	C-AL:470uF,20%,50V,GP,TP,13x20,5	1	C7		
-	2401-002620	C-AL:2200uF,20%,50V,GP,BK	1	C4		
-	2801-003263	CRYSTAL-UNIT:14.7456MHz,50ppm,28-ABR,30p	1	X1		
-	2801-003376	CRYSTAL-UNIT:0.032768MHz,20ppm,28-AAY,12	1	X2		
-	3002-001027	BUZZER-PIEZO:85dB,1.5V,24mA,2.048KHz,BK	1	AU1		
-	3301-000344	CORE-FERRITE BEAD:AA,-,3.5x0.6x6.5mm,-,-	1	L6		
-	3601-000261	FUSE-CARTRIDGE:250V,3.15A,TIME-LAG,GLASS	1	FU1		
-	3602-000001	FUSE-CLIP:-,-,30mohm	2	FU1		
-	3701-000240	CONNECTOR-DSUB:9P,2R,FEMALE,STRAIGHT,AUF	1	CN2		
-	3701-000240	CONNECTOR-DSUB:9P,2R,FEMALE,STRAIGHT,AUF	1	CN4		
-	3704-000255	SOCKET-IC:32P,DIP,SN,2.54mm	1	U19		
-	3704-000255	SOCKET-IC:32P,DIP,SN,2.54mm	1	U15		

10-1 Main PCB Layout

10-1-1-(b) Parts List

No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	3704-000255	SOCKET-IC:32P,DIP,SN,2.54mm	1	U15		
-	3708-000306	CONNECTOR-FPC/FFC/PIC:6P,2.54mm,STRAIGHT	1	CN17		
-	3708-000327	CONNECTOR-FPC/FFC/PIC:8P,2.54mm,STRAIGHT	1	CN16		
-	3711-000242	CONNECTOR-HEADER:1WALL,4P,1R,3.96mm,STRA	1	CN6		
-	3711-000840	CONNECTOR-HEADER:BOX,30P,2R,2MM,STRAIGHT	1	CN12		
-	3711-000840	CONNECTOR-HEADER:BOX,30P,2R,2MM,STRAIGHT	1	CN14		
-	3711-001475	CONNECTOR-HEADER:NOWALL,3P,1R,2.54mm,STR	1	CN13		
-	3710-000111	CONNECTOR-SHUNT:2P,1R,2.54mm,-,AUF	1	CN13		
-	3711-002002	CONNECTOR-HEADER:-,22P,2R,2mm,STRAIGHT,S	1	CN8		
-	3711-002002	CONNECTOR-HEADER:-,22P,2R,2mm,STRAIGHT,S	1	CN10		
-	3711-002812	CONNECTOR-HEADER:BOX,11P,1R,2mm,STRAIGHT	1	CN1		
-	3711-002812	CONNECTOR-HEADER:BOX,11P,1R,2mm,STRAIGHT	1	CN3		
-	3711-004102	WAFER;BOX-HEADER,1R,2P,2.5mm,STRAIGHT,BL	1	CN5		
-	3711-004105	WAFER;BOX-HEADER,1R,4P,2.5mm,STRAIGHT	1	CN7		
-	3711-004107	WAFER;BOX-HEADER,1R,5P,2.5mm,STRAIGHT	1	CN9		
-	3711-004109	WAFER;BOX-HEADER,1R,8P,2.5mm,STRAIGHT	1	CN15		
-	3711-004110	WAFER;BOX-HEADER,1R,8P,2.5mm,STRAIGHT,RE	1	CN11		
-	4302-000126	BATTERY-NICD(2ND):3.6V(1.2Vx3),60mAH,CYL	1	BAT1		
-	JK27-60100D	COIL FILTER:ER-350,140 UH,-,-	1	L5		
-	JK96-10039A	ELA HOU-HEATSINK:ER-380,7805/KSA1010Y	1	U5(7805)		
-	1203-000001	IC-POSI.FIXED REG.:7805,TO-220,3P,-,PLAS	1			
-	0502-000234	TR-POWER:KSA1010Y,PNP,40W,TO-220,TP,100	1			
-	6002-000175	SCREW-TAPPING:PWH,+,2,M3,L8,ZPC(YEL)	2			
-	0205-000003	OIL-SILICON:G746,-	1			
-	6203-000107	HEAT SINK:NONE,T2,W17,L22,H45,DEGRE,AL60	2			
-	JK94-01135A	PHANTOM AU JK92-01260A	1			
-	0201-001235	ADHESIVE-TS:DEH-390D,RED,400,-	1			
-	0202-000108	SOLDER-CREAM:RMA-010 T-322,S63,-,-	1			
-	0401-001003	DIODE-SWITCHING:MMBD6050LT1,70V,200mA,22	12	D9,D11,D12,D17,D20,D21 D22D23,D24,D25,D26,D27		
-	0402-001189	DIODE-RECTIFIER:M4,400V,1A,SMD-2,TP	8	D4,D5,D6,D7,D1,D2,D8,D18		
-	0404-001051	DIODE-SCHOTTKY:SK14,40V,1000MA,DO-214AA,	7	D10,D13,D14,D15,D16,D19 D28		
-	0501-000279	TR-SMALL SIGNAL:KSA1182-Y,PNP,150mW,SOT-	6	Q2,Q4,Q7,Q8,Q13,Q23		
-	0501-000457	TR-SMALL SIGNAL:MMBT2222A,NPN,350MW,SOT-	12	Q3,Q5,Q9,Q12,Q16,Q17,Q18 Q19,Q21,Q22,Q24,Q25		
-	0801-000523	IC-CMOS LOGIC:74HCT541,BUFFER/DRIVER,SOP	1	U23		
-	0801-000642	IC-CMOS LOGIC:74HC138,3-TO-8 DECODER,SOP	1	U11		
-	0801-000642	IC-CMOS LOGIC:74HC138,3-TO-8 DECODER,SOP	1	U21		
-	0801-000696	IC-CMOS LOGIC:74HC245,TRANSCEIVER,SOP,20	1	U13		
-	0801-000887	IC-CMOS LOGIC:74HCT08,AND GATE,SOP,14P,1	1	U12		
-	0801-001090	IC-CMOS LOGIC:74HC14,SCHIMITT INVERTER,S	1	U9		

10-1 Main PCB Layout

10-1-1-(b) Parts List

No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	0903-001155	IC-MICROCOMPUTER:30800SFP,16BIT,QFP,100P	1	U10		
-	0904-000411	IC-PERIPHERAL:82C55,8BIT,PLCC,44P	1	U18		
-	0909-000137	IC-REAL TIME CLOCK:RS5C372A,SSOP,8P	1	U14		
-	1003-001234	IC-MOTOR DRIVER:LB1838M,SOP,14P,173MIL,S	1	U6		
-	1006-000133	IC-DRIVER/RECEIVER:232,SOP,16P,150MIL,DU	1	U1		
-	1006-000133	IC-DRIVER/RECEIVER:232,SOP,16P,150MIL,DU	1	U2		
-	1006-000133	IC-DRIVER/RECEIVER:232,SOP,16P,150MIL,DU	1	U3		
-	1106-000131	IC-SRAM:681000,128Kx8BIT,SOP,32P,525MI	1	U16		
-	1106-000131	IC-SRAM:681000,128Kx8BIT,SOP,32P,525MI	1	U20		
-	1202-000164	IC-VOLTAGE COMP.:393,SOP,8P,150MIL,DUAL,	1	U17		
-	1203-000404	IC-DC/DC CONVERTER:34063,SOP,8P,150MIL,P	1	U4		
-	1205-001771	IC-CLOCK GENERATOR:FS781BZB,SOP,8PIN	1	U7		
-	2007-000026	R-CHIP:200OHM,5%,1/10W,DA,TP,2012	10	R48,R103,R110,R111,R112 R113,R114,R115,R120,R121		
-	2007-000028	R-CHIP:39OHM,5%,1/10W,DA,TP,2012	2	R67,R74		
-	2007-000030	R-CHIP:560OHM,5%,1/10W,DA,TP,2012	1	R16		
-	2007-000290	R-CHIP:100OHM,5%,1/10W,DA,TP,2012	18	R38,R43,R44,R45,R47,R50 R52,R53,R57,R59,R60,R64 R71,R73,R90,R91,R92,R96		
-	2007-000300	R-CHIP:10KOHM,5%,1/10W,DA,TP,2012	33	R1,R3,R5,R6,R9,R11,R13 R25,R27,R29,R30,R33,R36 R40,R46,R56,R58,R63,R65 R66,R69,R70,R75,R77,R79 R81,R84,R89,R94,R95,R105 R125,R130		
-	2007-000355	R-CHIP:12KOHM,5%,1/10W,DA,TP,2012	5	R97,R61,R76,R85,R87		
-	2007-000406	R-CHIP:15KOHM,1%,1/10W,DA,TP,2012	1	R68		
-	2007-000457	R-CHIP:18KOHM,5%,1/10W,DA,TP,2012	8	R116,R119,R122,R124,R126 R128,R131,R132		
-	2007-000468	R-CHIP:1KOHM,5%,1/10W,DA,TP,2012	7	R7,R8,R32,R39,R41,R72 R117		
-	2007-000518	R-CHIP:2.7KOHM,5%,1/10W,DA,TP,2012	1	R93		
-	2007-000642	R-CHIP:270OHM,5%,1/10W,DA,TP,2012	3	R80,R83,R104		
-	2007-000653	R-CHIP:27KOHM,5%,1/10W,DA,TP,2012	2	R14,R19		
-	2007-000686	R-CHIP:3.3KOHM,5%,1/10W,DA,TP,2012	3	R15,R49,R88		
-	2007-000872	R-CHIP:4.7KOHM,5%,1/10W,DA,TP,2012	23	R2,R4,R12,R17,R18,R23,R28 R31,R34,R37,R42,R51,R54 R55,R62,R86,R99,R100,R101 R102,R108,R127,R129		
-	2007-000931	R-CHIP:470OHM,5%,1/10W,DA,TP,2012	6	R24,R78,R106,R109,R118 R123		
-	2007-001039	R-CHIP:56KOHM,5%,1/10W,DA,TP,2012	1	R82		
-	2007-001071	R-CHIP:6.8KOHM,5%,1/10W,DA,TP,2012	1	R98		
-	2007-001071	R-CHIP:6.8KOHM,5%,1/10W,DA,TP,2012	1	R107		
-	2011-001093	R-NETWORK:100ohm,5%,1/16W,L,CHIP,8P,TP	1	RA1		
-	2011-001093	R-NETWORK:100ohm,5%,1/16W,L,CHIP,8P,TP	1	RA2		

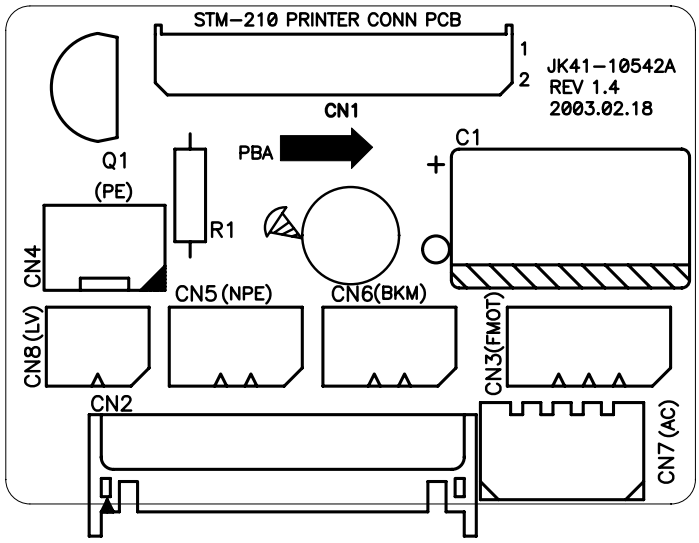
10-1 Main PCB Layout

10-1-1-(b) Parts List

No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	2203-000192	C-CERAMIC,CHIP:100nF,+80-20%,50V,Y5V,TP,	36	C3,C9,C10,C25,C29,C40,C43 C44,C46,C47,C49,C56,C57 C58,C62,C63,C64,C65,C67 C72,C73,C75,C76,C78,C81 C82,C84,C85,C86,C87,C88 C89,C90,C91,C93,C95		
-	2203-000239	C-CERAMIC,CHIP:0.1nF,5%,50V,NP0,TP,2012	14	C39,C41,C42,C45,C53,C55 C59,C60,C66,C68,C69,C70 C71,C80		
-	2203-000260	C-CERAMIC,CHIP:10nF,10%,50V,X7R,TP,2012	3	C74,C79,C61		
-	2203-000595	C-CERAMIC,CHIP:0.22nF,5%,50V,NP0,TP,2012	1	C54		
-	2203-000634	C-CERAMIC,CHIP:0.022nF,5%,50V,NP0,TP,201	1	C51		
-	2203-000634	C-CERAMIC,CHIP:0.022nF,5%,50V,NP0,TP,201	1	C52		
-	2203-000938	C-CERAMIC,CHIP:0.47nF,5%,50V,NP0,TP,2012	12	C2,C6,C11,C13,C15,C18,C19 C20,C21,C22,C24,C30		
-	2203-000990	C-CERAMIC,CHIP:1uF,+80-20%,25V,Y5V,TP,20	15	C8,C12,C14,C16,C17,C23 C26C28,C31,C32,C33,C35 C36,C37,C38		
-	3301-000317	CORE-FERRITE BEAD:AB,2x1.25x0.9mm,-,-	16	L1,L2,L3,L4,L7,L8,L9,L10,L11 L12,L13,L14,L15,L16,L17,L18		
-	JK41-10552A	PCB-MAIN:ER-380M,FR-4,2L,T1.6mm	1			

10-2 STM-210 Printer PCB Layout

10-2-1 Component Side

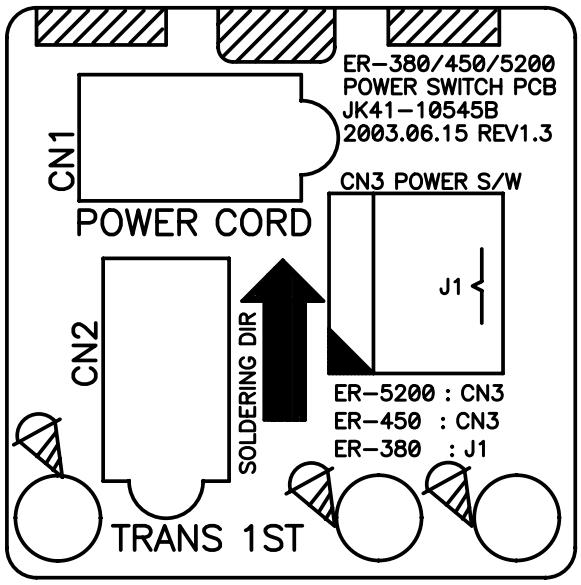


10-2-2 Parts List

No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	JK92-01225A	PBA SUB-PRT CONN BOARD:STM-210,ER-5500	1	ASSY	Y	
-	3708-001390	CONNECTOR-FPC/FFC/PIC:21P,2.54MM,STRAIGH	1	CN1	Y	
-	3711-000961	CONNECTOR-HEADER:BOX,4P,1R,2.5mm,STRAIGH	1	CN3	Y	
-	3711-003969	CONNECTOR-HEADER:BOX,2P,1R,2.5mm,STRAIGH	1	CN8	Y	
-	3711-003409	CONNECTOR-HEADER:BOX,3P,1R,2mm,STRAIGHT,	1	CN4	Y	
-	3711-004059	CONNECTOR-HEADER:BOX,30P,2R,2mm,ANGLE,SN	1	CN2	Y	
-	3711-000965	CONNECTOR-HEADER:BOX,4P,1R,2.5mm,ANGLE	1	CN7	Y	
-	3711-003968	CONNECTOR-HEADER:BOX,3P,1R,2.5mm,STRAIGH	1	CN5	Y	
-	0501-000399	TR-SMALL SIGNAL:KSC945-G,NPN,250mW,TO-92	1	Q1	Y	
-	2001-000395	R-CARBON:180KOHM,5%,1/4W,AA,TP,2.4X6.4MM	1	R1	Y	
-	2401-000131	C-AL:1000uF,20%,16V,GP,TP,10x20,5	1	C1	Y	
-	JK41-10542A	PCB-PRT CONN:STM-210,FR-4,2L,T1.6mm,57	1	PCB	Y	

10-3 Power Switch PCB Layout

10-3-1 Component Side View



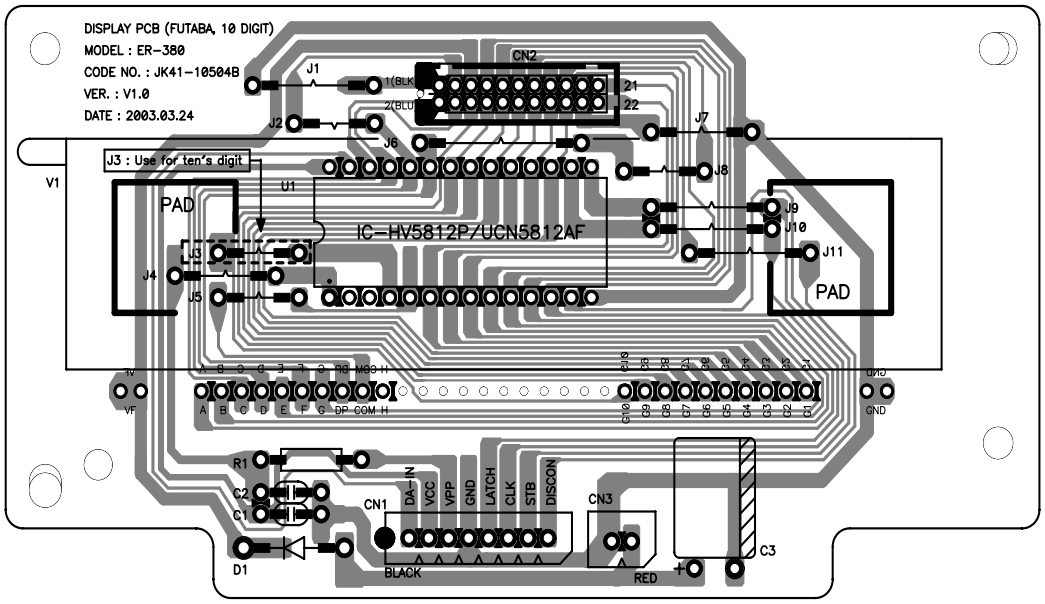
10-3-2 Parts List

No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	JK92-01227B	PBA SUB-POWER SW:ER-5200/5500,STD	1	ASSY	Y	
-	3711-000190	CONNECTOR-HEADER:1WALL,2P,1R,7.92mm,STRA	1	CN3	Y	
-	3711-000829	CONNECTOR-HEADER:BOX,2P,1R,6.2mm,STRAIGH	2	CN1, CN2	Y	
-	JK41-10545B	PCB-POWER SWITCH:ER-52/5500,FR-1,1L,T1.6	1		Y	

10-4 Display Layout

10-4-1 ER-380F Front Display (VFD 10Digit)

10-6-1-(a) Component Side View



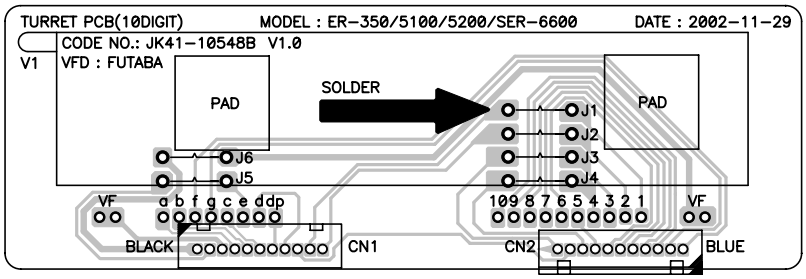
10-4-1-(b) Parts List (Front Display)

No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
	3711-004111	WAFER;BOX-HEADER,1R,8P,2.5mm,ANGLE	1	CN1	Y	
	3711-002002	CONNECTOR-HEADER:-,22P,2R,2mm,STRAIGHT,S	1	CN2	Y	
	JK07-00005A	DISPLAY VFD-DC10G:FUTABA,10-LT-50GK	1	V1	Y	
	JK39-00034A	CONNECT WIRE-350 DISPLAY:ER-350,FLAT,UL1	1	8P	Y	
	JK73-10207A	RPR-PAD:ER-220N,SPONGE,-,BLK,-	2	T5.0	Y	
	1003-001381	IC-VFD:HV5812P,DIP,28P,540MIL,-,-,ST,PLA	1	U1	Y	
	JK69-90902A	PACKING-VINYL:PET,#2126,30X100000XT0.05,	1	DIGITRON	Y	
	0402-000208	DIODE-RECTIFIER:EK-04,40V,1.5A,DO-41	1	D2	Y	
	JK94-01120A	PHANTOM AU JK92-01240A	1		N	
	0402-000129	DIODE-RECTIFIER:1N4003,200V,1A,DO-41,TP	1	D1	Y	
	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	5	J1,J2,J3,J4,J5	Y	
	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	5	J6,J7,J8,J9,J10	Y	
	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	5	J11,J12,J13,J14,J15	Y	
	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	5	J16,J17,J18,J19,J20	Y	
	JK41-10005B	PCB-DISPLAY(10G):ER-350/F,FR-1,1L,T1.6,F	1		Y	

10-4 Display Layout

10-4-2 ER-380F Rear Display (VFD 10Digit)

10-4-2-(a) Component Side View

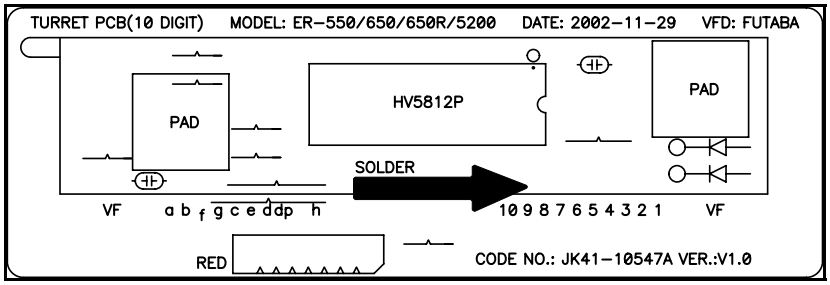


10-4-2-(b) Parts List (Rear Display)

No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
	JK92-01231A	PBA SUB-TURRET:ER-5100/5200,STD	1	REAR DISPLAY ASSY	Y	
	JK39-40002A	CBF HARNESS:ER-220N,-,UL1061,400MM,BLK/R	1	DISPLAY TO MAIN	Y	
	JK07-00005A	DISPLAY VFD-DC10G:FUTABA,10-LT-50GK	1	FUTABA VFD/10 DIGIT	Y	
	3711-002812	CONNECTOR-HEADER:BOX,11P,1R,2mm,STRAIGHT	2	CN1,CN2	Y	
	JK73-10207A	RPR-PAD:ER-220N,SPONGE,-,BLK,-	2	PAD	Y	
	JK94-00053A	PHANTOM AU JK92-01231A	1	AUTO	N	
	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	5	JP1,JP2,JP3,JP4,JP5,JP6	Y	
	JK41-10548B	PCB-TURRET:ER-5100/5200,FR-1,1L,T1.6	1	FUTABA VFD/10 DIGIT	Y	

10-4-3 ER-380M Rear Display (VFD 10Digit)

10-4-2-(a) Component Side View

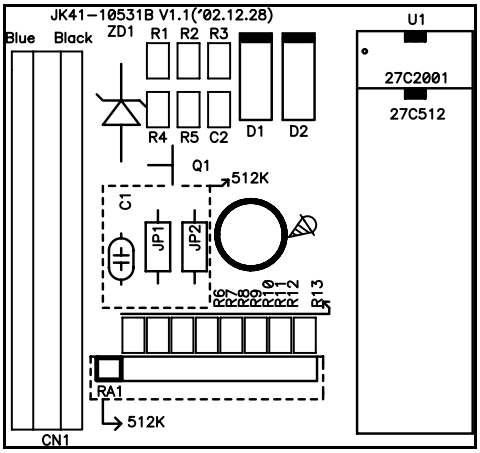


10-4-2-(b) Parts List (Rear Display)

No	Part -No	Description/Specification	Q'TY	Design Location	Serviceable	Remarks
-	JK92-00970B	PBA SUB-TURRET:ER-450,WORLD,BASIC	1			
-	3711-004109	WAFER;BOX-HEADER,1R,8P,2.5mm,STRAIGHT	1	CN1	WHITE	
-	JK07-00005A	DISPLAY VFD-DC10G:FUTABA,10-LT-50GK	1	V1		
-	JK39-40606A	HARNESS-TURRET:ER-450,8P,500mm,TUBE	1	TURR TO MAIN	TUBE	
-	JK73-10207A	RPR-PAD:ER-220N,SPONGE,-,BLK,-	2	T5.0		
-	1003-001381	IC-VFD:HV5812P,DIP,28P,540MIL,-,-,ST,PLA	1	U1		
-	JK69-90902A	PACKING-VINYL:PET,#2126,30X100000XT0.05,	1	DIGITRON		
-	JK94-00028A	PHANTOM AU JK92-00968A	1			
-	0402-000129	DIODE-RECTIFIER:1N4003,200V,1A,DO-41,TP	1	D1		
-	0402-000208	DIODE-RECTIFIER:EK-04,40V,1.5A,DO-41	1	D2		
-	JK41-10547A	PCB-TURRET:ER-650/5200,FR-1,1L,T1.6	1			
-	2202-000579	C-CERAMIC,MLC-AXIAL:100nF,+80-20%,50V,Z5	2	C1,C2		
-	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	9	J1 ~ J9		

10-5 Fiscal Layout

10-5-1 Component Side View



10-5-2 Parts List

10-5-2-(a) Parts List (Memory Size = 512KBITs)

No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
	JK92-00132A	PBA SUB-FISCAL B/D:ER-5240F,512Kbit	1	512KBITs ASSY	Y	
	JK39-40305B	CBF HARNESS:,-,UL 1007,120,WHT/BLU/RED,2	1	FISCAL HARNESS	Y	
	1102-000173	IC-EPROM:27C512,64Kx8BIT,DIP,28P,600MIL	1		Y	
	JC39-40511A	CBF HARNESS:ML-80,JUMPER,AWG22,52mm,SILV	2	JP1,JP2	Y	
	JK94-00055B	PHANTOM AU JK92-00132A	1		N	
	2007-000872	R-CHIP:4.7KOHM,5%,1/10W,DA,TP,2012	8	R6,R7,R8,R9,R10,R11,R12,	Y	
				R13		
	2203-000192	C-CERAMIC,CHIP:100nF,+80-20%,50V,Y5V,TP,	1	C2	Y	
	JK41-10531B	PCB-FISCAL:ER-5240F,FR-4,2L,T1.6mm,348X5	1		Y	

10-5-2-(b) Parts List (Memory Size = 1MBITs)

No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
	JK92-00132B	PBA SUB-FISCAL B/D;1MBITs	1	1MBITs ASSY	Y	
	1102-000109	IC-EPROM:27C010,128Kx8BIT,DIP,32P,600MI	1	U1	Y	
	0403-000141	DIODE-ZENER:1N4735A,6.2V,5%,1W,DO-41,TP	1	ZD1	Y	
	JK39-40305B	CBF HARNESS:,-,UL 1007,120,WHT/BLU/RED,2	1	CN1	Y	
	JK94-00055A	PHANTOM AU JK92-00132B	1		N	
	2007-000029	R-CHIP:0OHM,5%,1/10W,DA,TP,2012	1	R3	Y	
	2007-000030	R-CHIP:560OHM,5%,1/10W,DA,TP,2012	1	R2	Y	
	2007-000221	R-CHIP:1.2KOHM,5%,1/10W,DA,TP,2012	1	R4	Y	
	2007-000872	R-CHIP:4.7KOHM,5%,1/10W,DA,TP,2012	10	R1,R5,R6,R7,R8,R9,R10,R11	Y	
				R12,R13		
	2203-000192	C-CERAMIC,CHIP:100nF,+80-20%,50V,Y5V,TP,	1	C2	Y	
	0404-001051	DIODE-SCHOTTKY:SK14,40V,1000MA,DO-214AA,	2	D1,D2	Y	
	0501-000457	TR-SMALL SIGNAL:MMBT2222A,NPN,350MW,SOT-	1	Q1	Y	
	JK41-10531B	PCB-FISCAL:ER-5240F,FR-4,2L,T1.6mm,348X5	1		Y	

10-5 Fiscal Layout

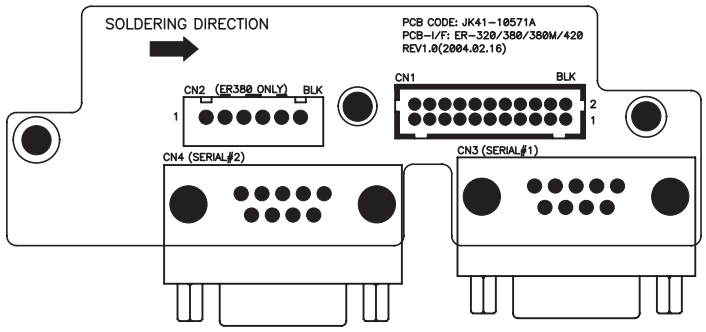
10-5-2 Parts List

10-5-2-(c) Parts List (Memory Size = 2MBITs)

No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
	JK92-00132C	PBA SUB-FISCAL B/D;2MBITs	1	2MBITs ASSY	Y	
	1102-000136	IC-EPROM:27C020,256Kx8BIT,DIP,32P,600MI	1	U1	Y	
	0403-000141	DIODE-ZENER:1N4735A,6.2V,5%,1W,DO-41,TP	1	ZD1	Y	
	JK39-40305B	CBF HARNESS:,-,UL 1007,120,WHT/BLU/RED,2	1	CN1	Y	
	JK94-00055A	PHANTOM AU JK92-00132B	1		N	
	2007-000029	R-CHIP:0OHM,5%,1/10W,DA,TP,2012	1	R3	Y	
	2007-000030	R-CHIP:560OHM,5%,1/10W,DA,TP,2012	1	R2	Y	
	2007-000221	R-CHIP:1.2KOHM,5%,1/10W,DA,TP,2012	1	R4	Y	
	2007-000872	R-CHIP:4.7KOHM,5%,1/10W,DA,TP,2012	10	R1,R5,R6,R7,R8,R9,R10, R11,R12,R13	Y	
	2203-000192	C-CERAMIC,CHIP:100nF,+80-20%,50V,Y5V,TP,	1	C2	Y	
	0404-001051	DIODE-SCHOTTKY:SK14,40V,1000MA,DO-214AA,	2	D1,D2	Y	
	0501-000457	TR-SMALL SIGNAL:MMBT2222A,NPN,350MW,SOT-	1	Q1	Y	
	JK41-10531B	PCB-FISCAL:ER-5240F,FR-4,2L,T1.6mm,348X5	1		Y	

10-6 Interface Layout

10-6-1 Exploded View



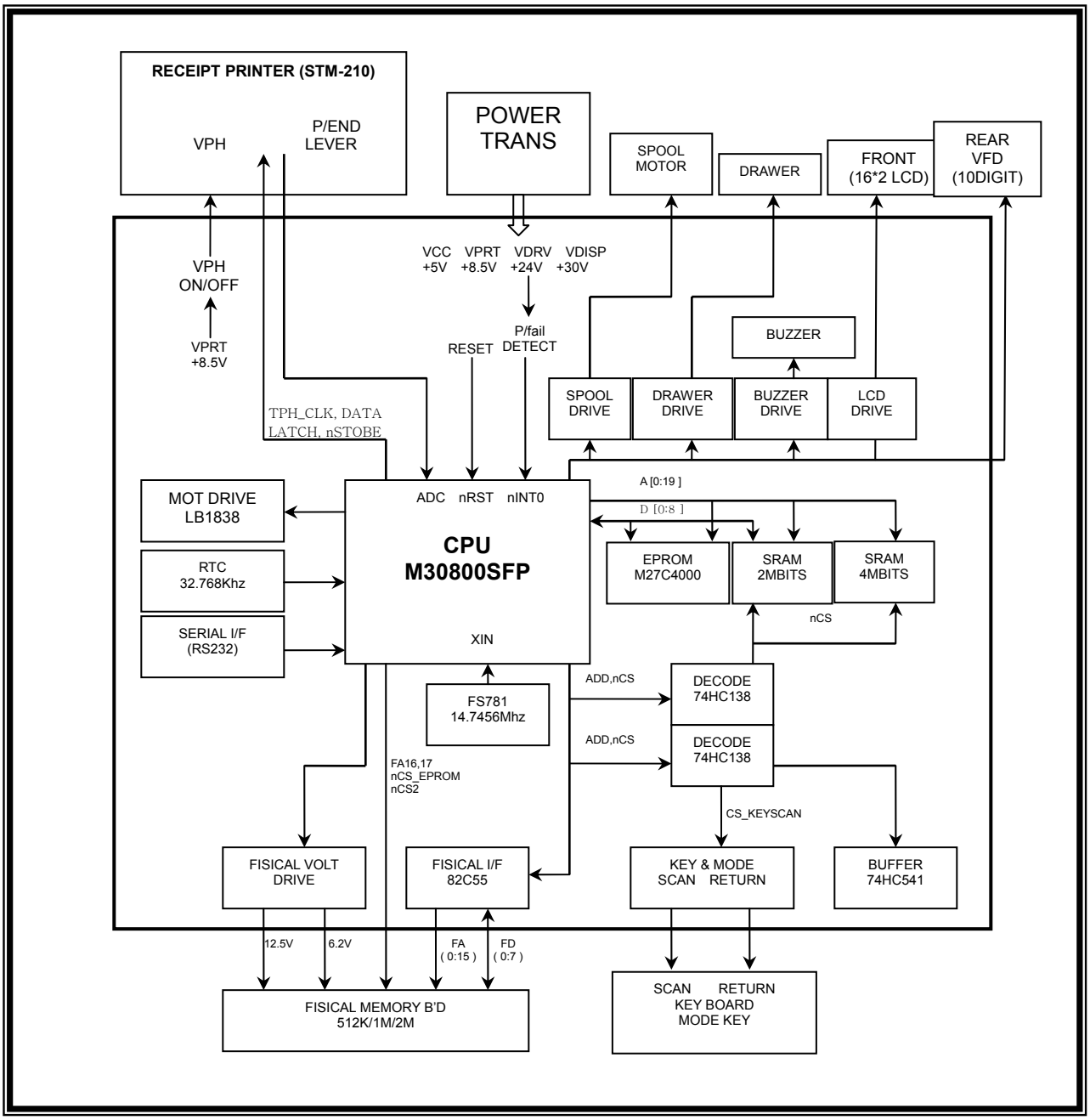
10-6-2 Parts List

No	Part-No	Description / Specification	Q'TY	Design Location	Serviceable	Remarks
-	JK92-01280A	PBA SUB-I/F:ER-380/M,232*2	1			
-	3711-004108	WAFER;BOX-HEADER,1R,6P,2.5mm,STRAIGHT	1	CN2		ONLY ER-380
-	3711-002002	CONNECTOR-HEADER:-,22P,2R,2mm,STRAIGHT,S	1	CN1		
-	3701-000232	CONNECTOR-DSUB:9P,2R,FEMALE,ANGLE,AUF	1	CN3		
-	3701-000232	CONNECTOR-DSUB:9P,2R,FEMALE,ANGLE,AUF	1	CN4		
-	JK41-10571A	PCB-I/F:ER-380/M,232*2,FR-4,2L,T1.6mm	1			

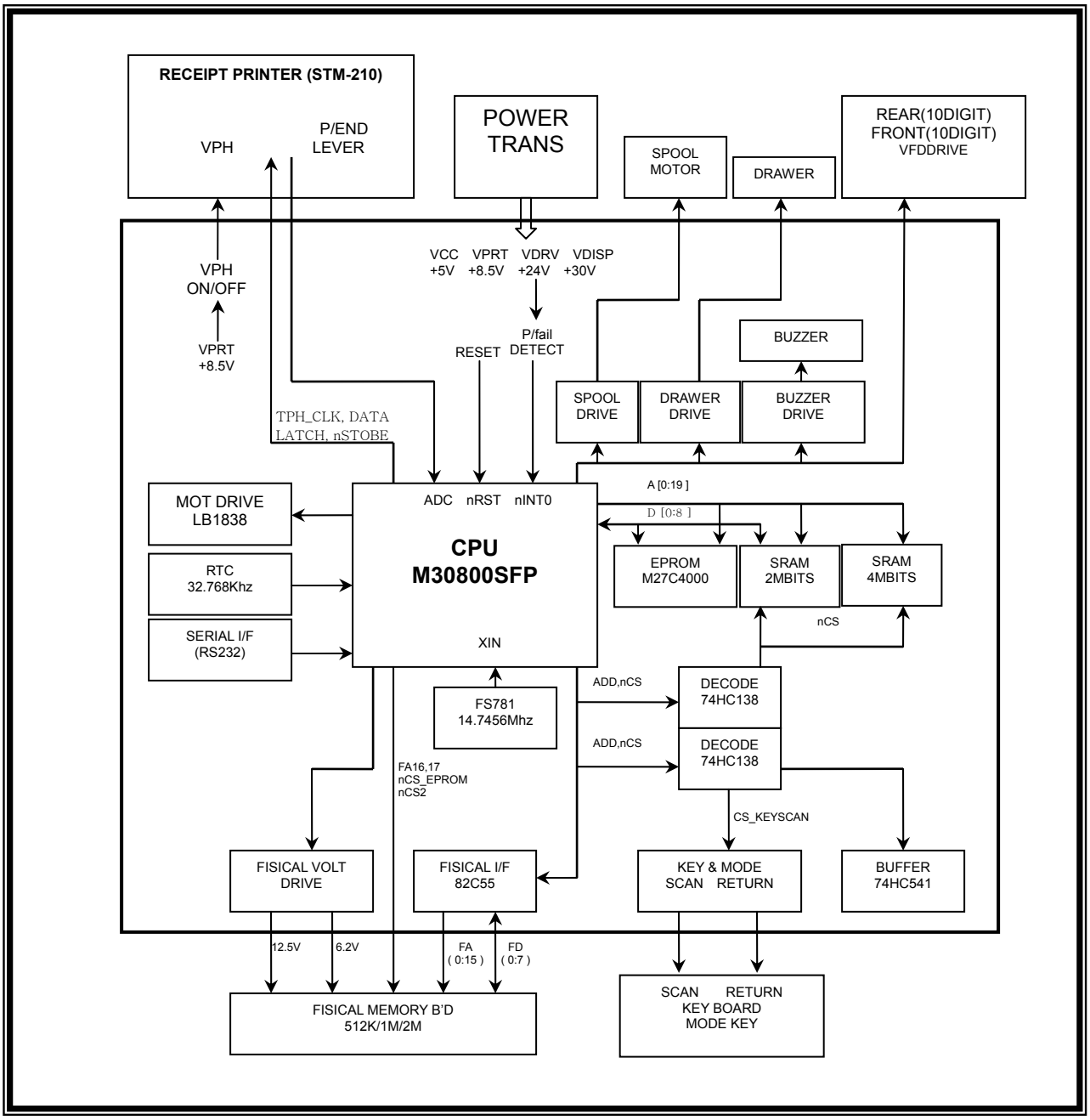
MEMO

11 Block Diagram

11-1 ER-380M



11-2 ER-380F


RECEIPT PRINTER (STM-210)
VPH
P/END
LEVER
POWER
TRANS
SPOOL
MOTOR
DRAWER
REAR(10DIGIT)
FRONT(10DIGIT)
VFDDRIVE
VCC
+5V
VPRT
+8.5V
VDRV
+24V
VDISP
+30V
VPH
ON/OFF
VPRT
+8.5V
RESET
P/fail
DETECT
BUZZER
SPOOL
DRIVE
DRAWER
DRIVE
BUZZER
DRIVE
TPH_CLK, DATA
LATCH, nSTOBE
A [0:19]
D [0:8]
MOT DRIVE
LB1838
RTC
32.768Khz
SERIAL I/F
(RS232)
ADC nRST nINT0
CPU
M30800SFP
XIN
EPROM
M27C4000
SRAM
2MBITS
SRAM
4MBITS
nCS
FS781
14.7456Mhz
ADD,nCS
DECODE
74HC138
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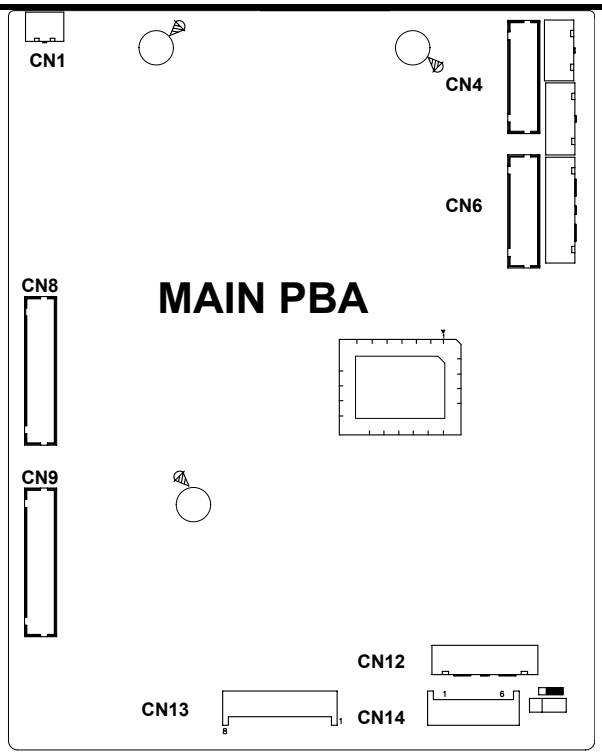
74HC138
FA16,17
nCS_EPROM
nCS2
CS_KEYSCAN
FISICAL VOLT
DRIVE
FISICAL I/F
82C55
KEY & MODE
SCAN RETURN
BUFFER
74HC541
12.5V
6.2V
FA
(0:15)
FD
(0:7)
FISICAL MEMORY B'D
512K/1M/2M
SCAN RETURN
KEY BOARD
MODE KEY

12 Wiring Diagram

12-1 Wiring Pin Connection



CN8 = Main to Printer		CN7=Display (VFD)		CN9 = Main to Fiscal PBA I/F	
No	Signal Name	No	Signal Name	No.	Signal Name
1	VCC	1	SEN_DISPDISCON	1	FA17
2	Lever Sensor In	2	VCC	2	FA16
3	P/END Sensor Light	3	DISPLAY_CLK	3	FA7
4	P/END Sensor In	4	DISPLAY_LATCH	4	FA3
5	N/END Sensor Light	5	GND	5	FA6
6	N/END Sensor In	6	VDISP	6	FA2
7	BMARK Sensor Light	7	VCC	7	FA5
8	BMARK Sensor In	8	DIPLAY_DATA	8	FA1
9	Thermister Input			9	FA4
10	GND	CN3=Drawer		10	FA0
11	PSTROBE#2	No	Signal Name	11	CS_FISCAL EPROM
12	PCLK	1	GND	12	FA15
13	GND	2	SEN_DWRCOMP	13	GND
14	GND	3	DRAWER	14	FA14
15	PSTROBE#1	4	VDRV	15	VCC
16	PDATA			16	FA13
17	PLATCH	CN5=Black Box		17	VPP
18	GND	No	Signal Name	18	FA12
19	GND	1	VCC	19	FD3
20	VPH (+8.5V)	2	TXD1/CLK	20	FA8
21	VPH (+8.5V)	3	RXD1/DATA	21	FD4
22	VPH (+8.5V)	4	GND	22	FA9
23	GND			23	FD5
24	MOT_LF_B-	**CN13 / 14= Keyboard**		24	FA10
25	ACUT SENS IN(Only Receipt)			25	FD6
26	MOT_LF_B+	**CN 4= RS-232 / CN6=LCD DISPLAY**		26	FA11
27	MOT_ACUT1(Only Receipt)			27	FD7
28	MOT_LF_A+	**CN1 = SPOOL**		28	FD0
29	MOT_ACUT2(Only Receipt)			29	FD2
30	MOT_LF_A-	**CN12 = MODE KEY**		30	FD1

MEMO

13 Schematic Diagrams

[Schematics Sheet Content]

1. Main PCB Schematics.

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6) Printer Block ---------- 13-8
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8) Power Block ---------- 13-10

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3. Display PCB Schematics.

1) VFD Front Schematics(ER-380F) ---------- 13-12
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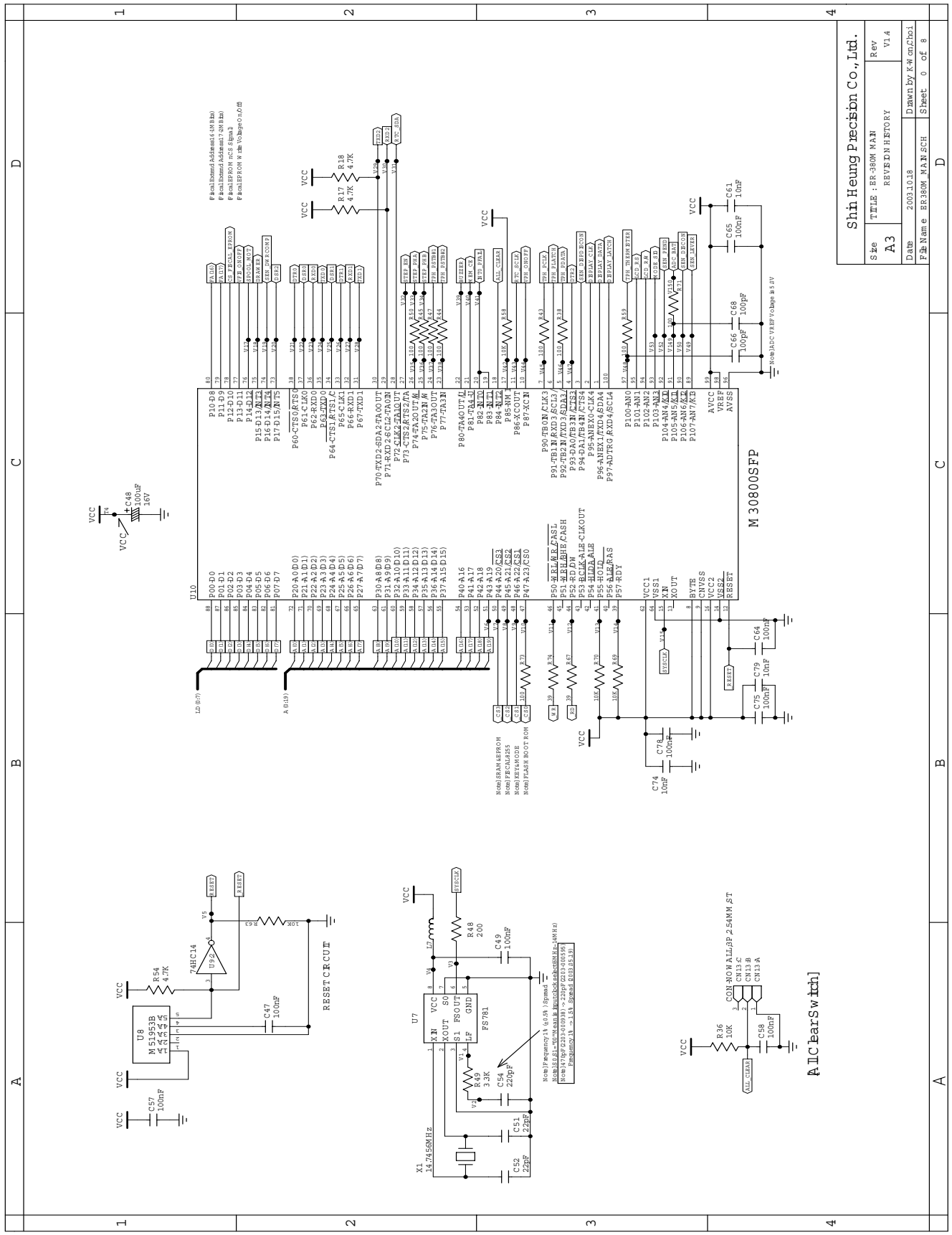
4. Fiscal PCB Schematics. ---------- 13-15

5. STM-210 Printer PCB Schematics. ---------- 13-16

6. Interface PCB Schematics. ---------- 13-17


Shin Heung Precision Co., Ltd.
Size A3
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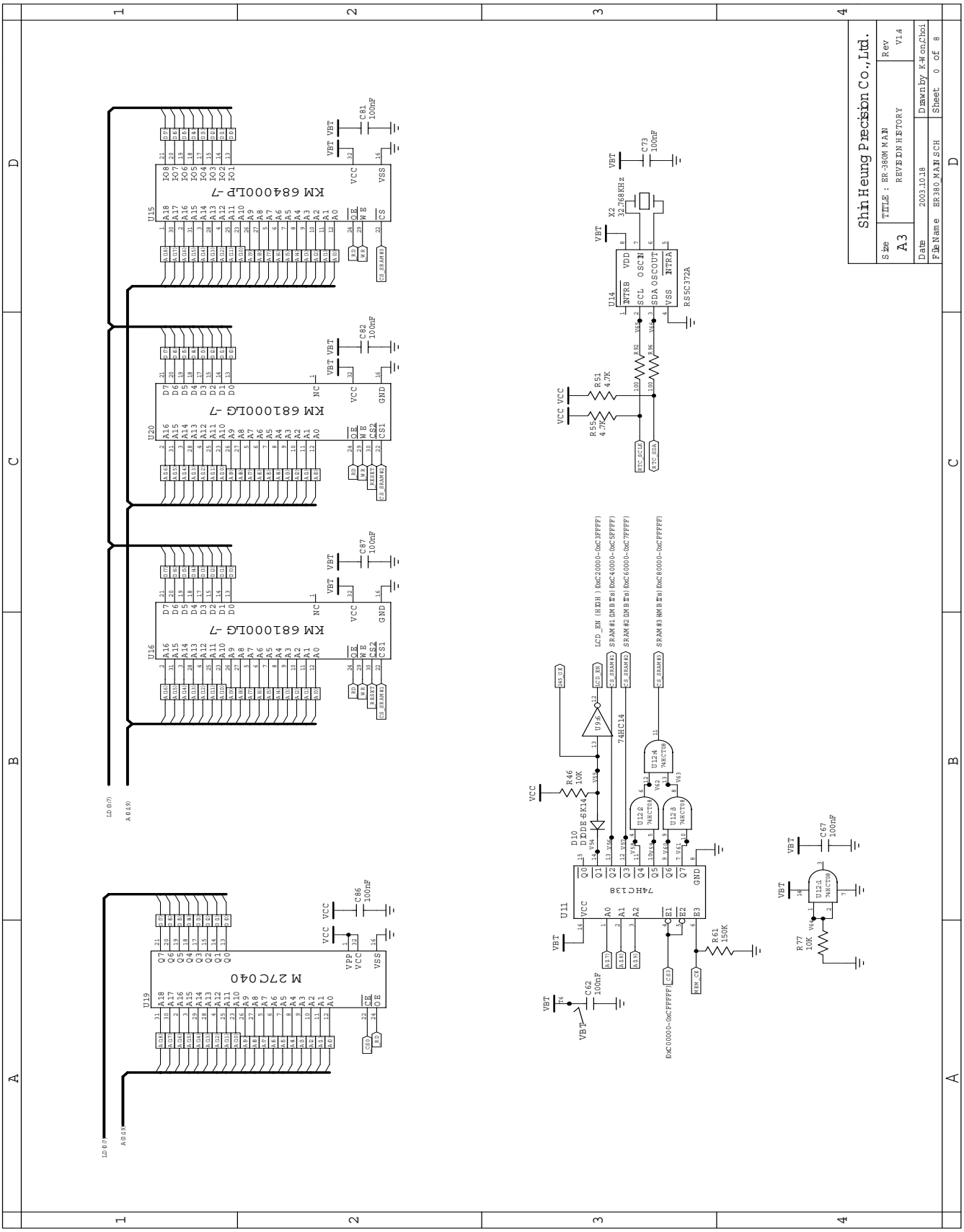
Rev V1.4
Date 2003.10.18
Drawn by K.W.cm,Cho1
File Name ER380M_MAIN.SCH
Sheet 0 of 8
M30800SFP
U10
U8 M51953B
U7
74HC14
X1 14.74560MHz
CON-NO WALL,2P 2.54MM,ST
ALL_CLEAR
RESET CIRCUIT
VCC
GND


Shin Heung Precision Co., Ltd.
Size A3
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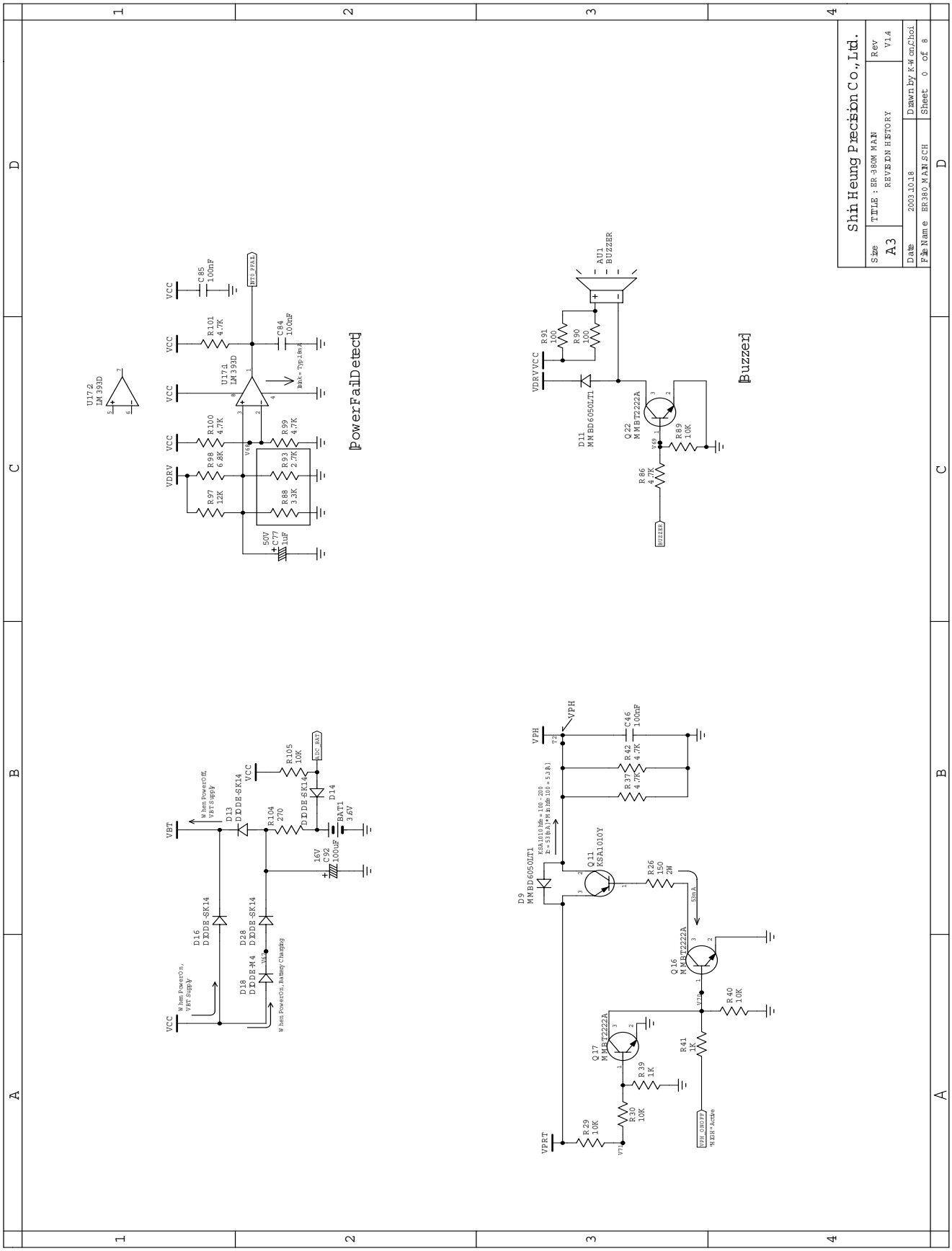
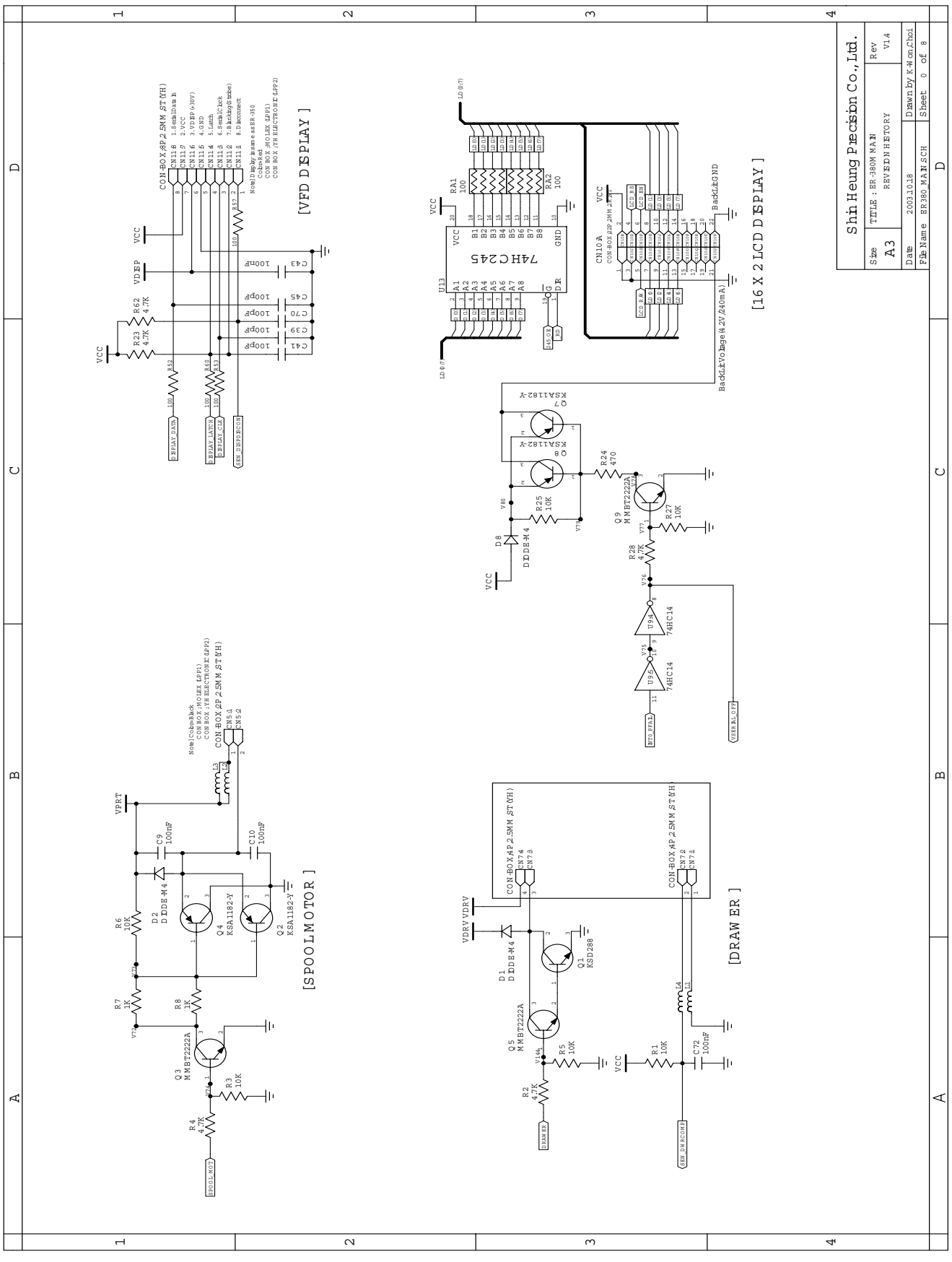
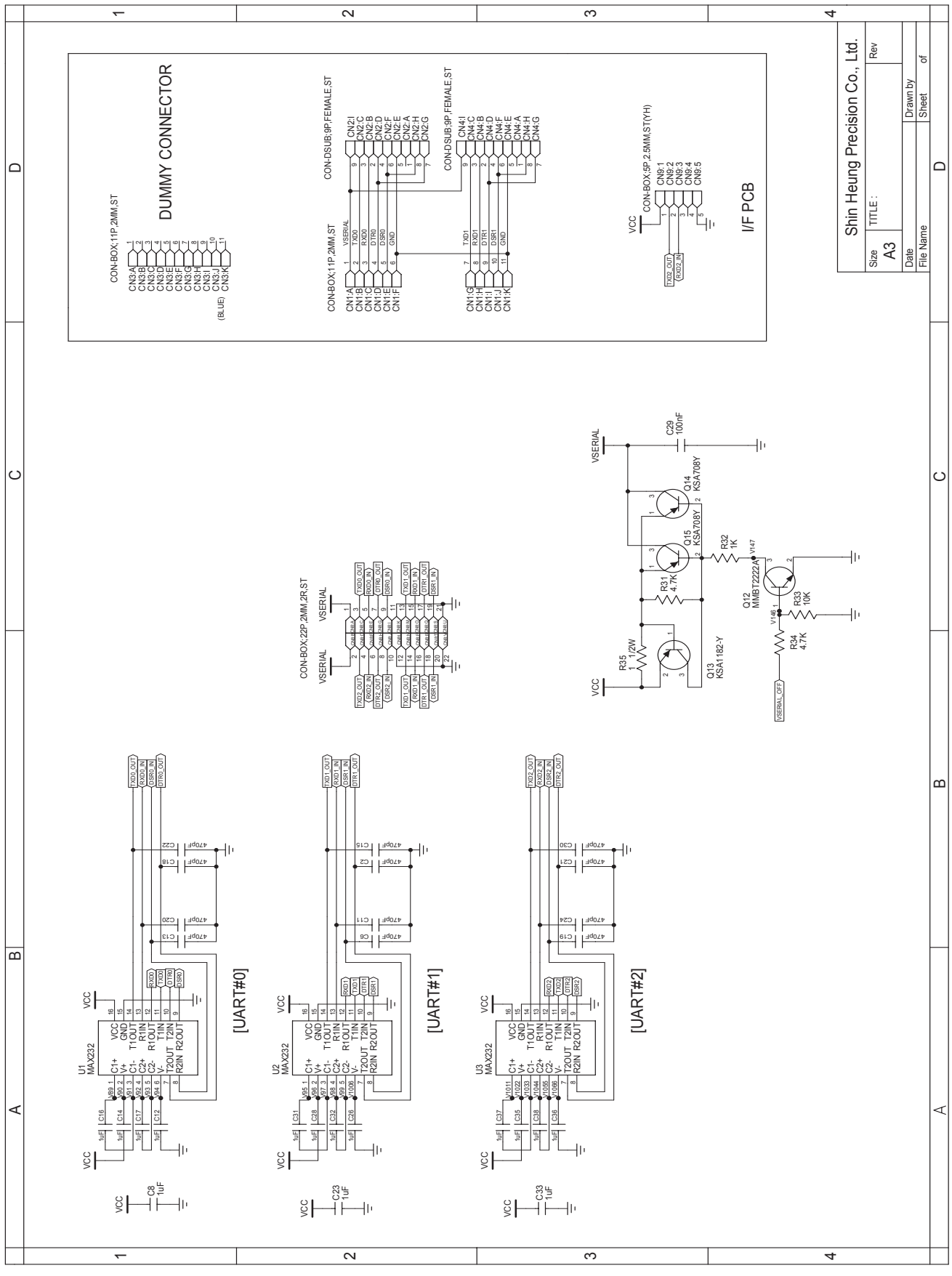
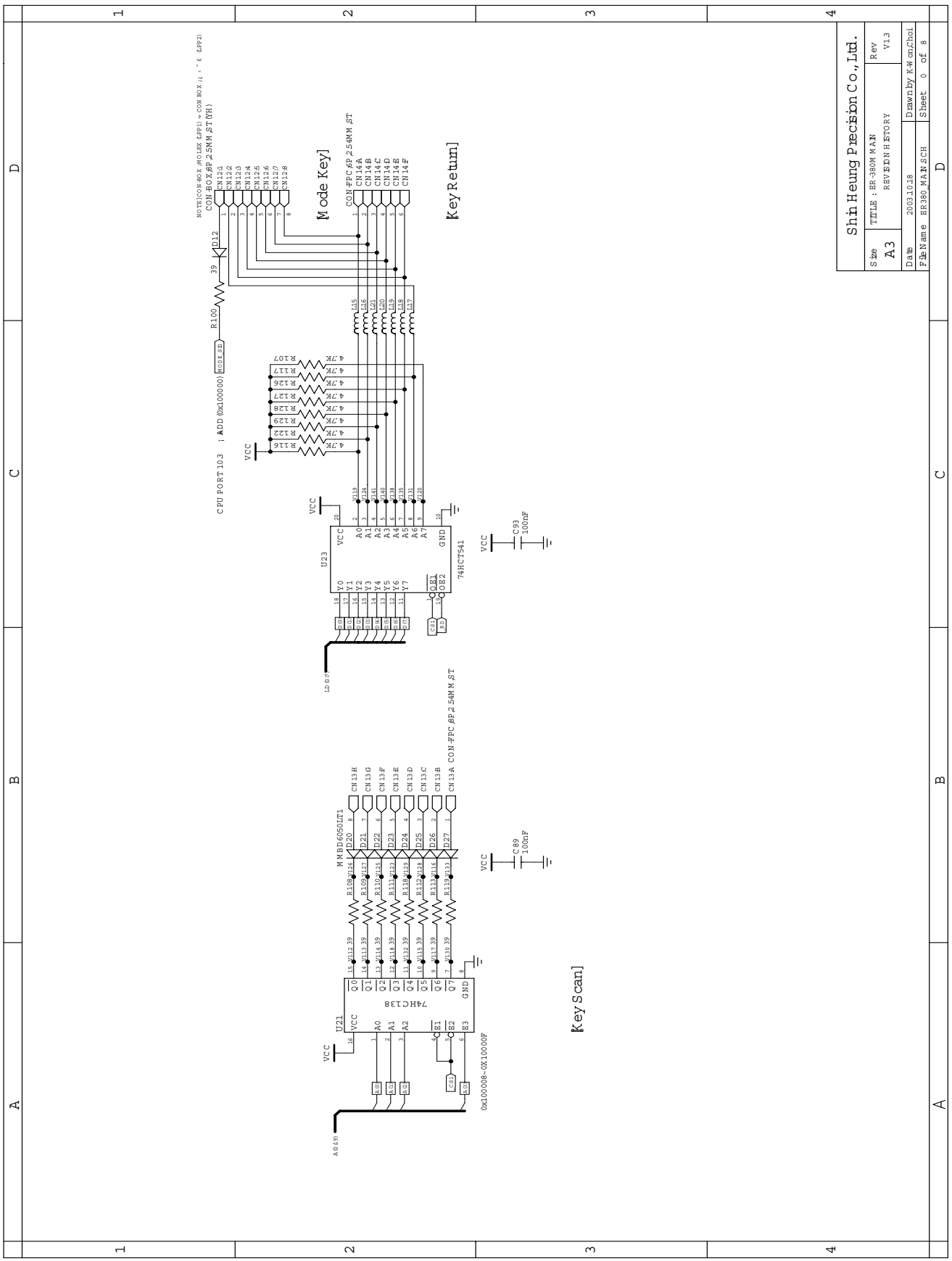
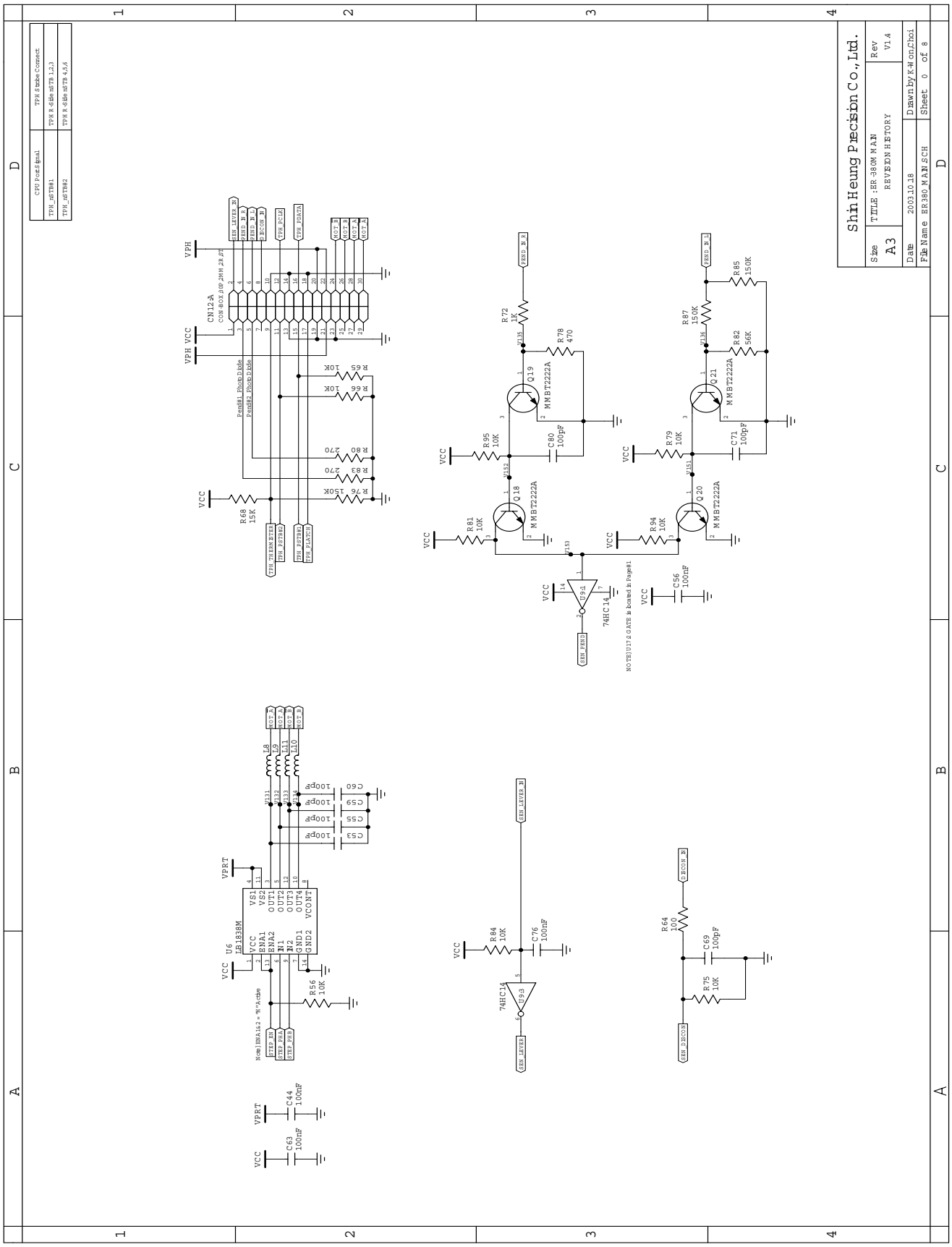
REVISION HISTORY
Rev V1.4
Date 2003.10.18
Drawn by K-Won Choi
FileName ER380_MAIN.SCH
Sheet 6 of 8
KM684000LP-7
KM681000LG-7
M27C040
74HC138
RS5C372A

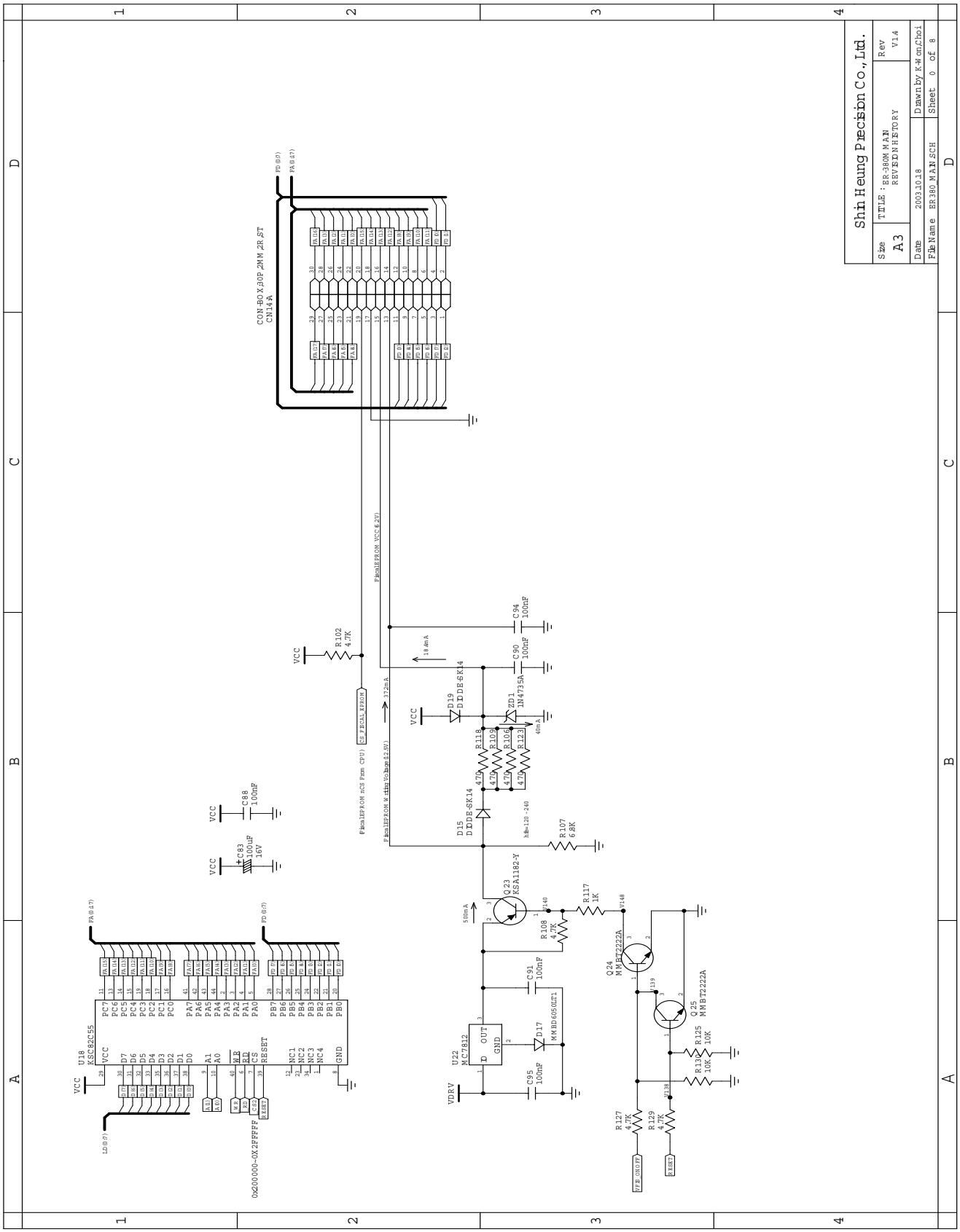

Shin Heung Precision Co., Ltd.
Size A3
TITLE : ER-380M MAN
REVISION HISTORY
Rev V1.4
Date 2003.10.18
Drawn by K-W an Choi
File Name ER380_MAN.SCH
Sheet 0 of 8
PowerFailDetect
Buzzer
When PowerOn, VBT Supply
When PowerOn, Battery Charging
VPH_ON/OFF "HIGH" Active

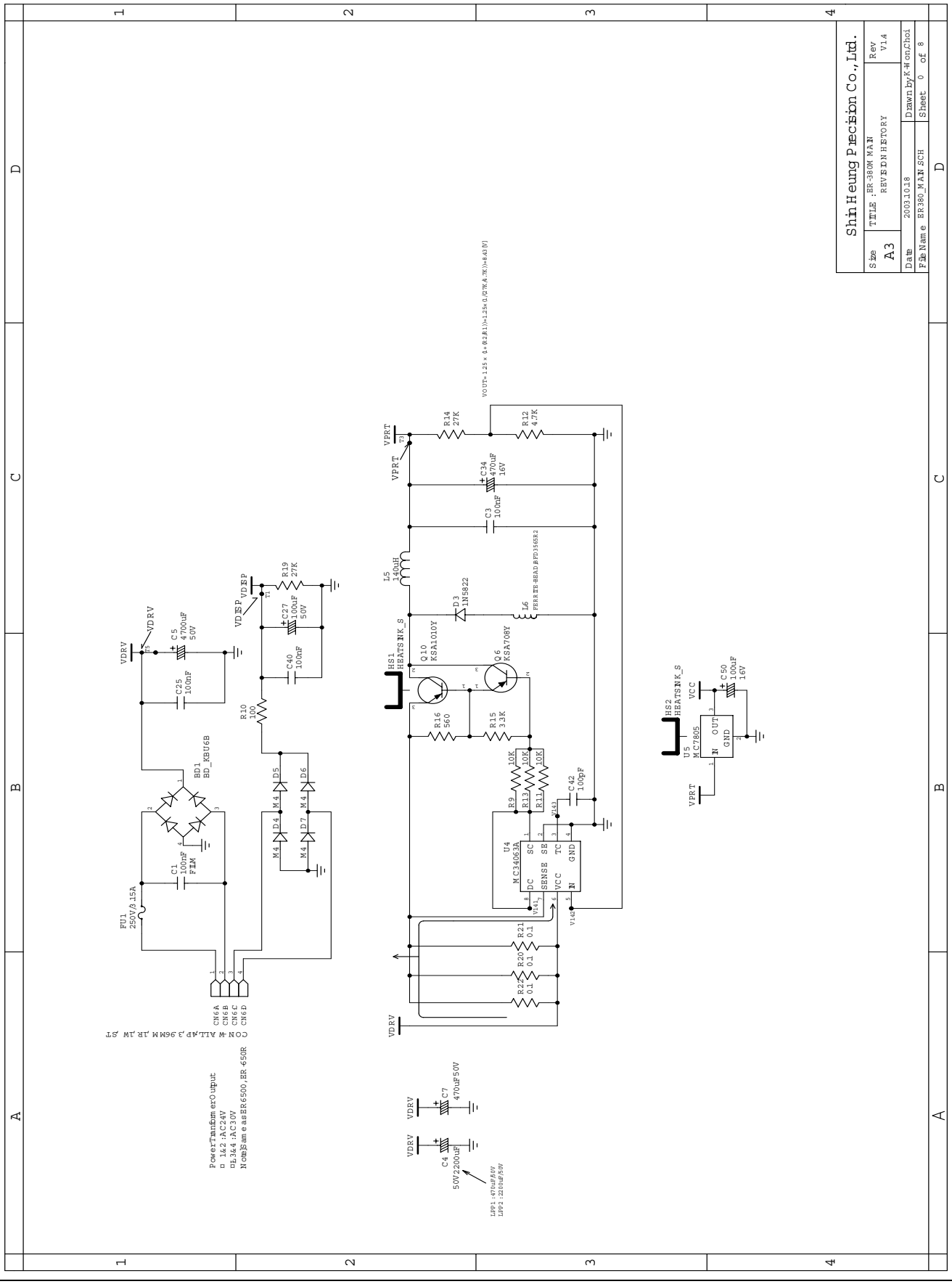

Shin Heung Precision Co., Ltd.
TITLE : ER-380M MAIN
REVISION HISTORY
Rev V1.4
Size A3
Date 2003.10.18
Drawn by K-W on Choi
File Name ER380_MAIN.SCH
Sheet 0 of 8
[VFD DISPLAY]
[16 X 2 LCD DISPLAY]
[SPOOL MOTOR]
[DRAWER]
CON-BOX,6P,2.5MM,ST(VH)
CON-BOX,2P,2.5MM,ST(VH)
74HC245
74HC14
MMBT2222A
KSA1182-Y
KSD288
DDDB-M4
VCC
VDSP
VPRT
VDRV
Back-LIGHT GND

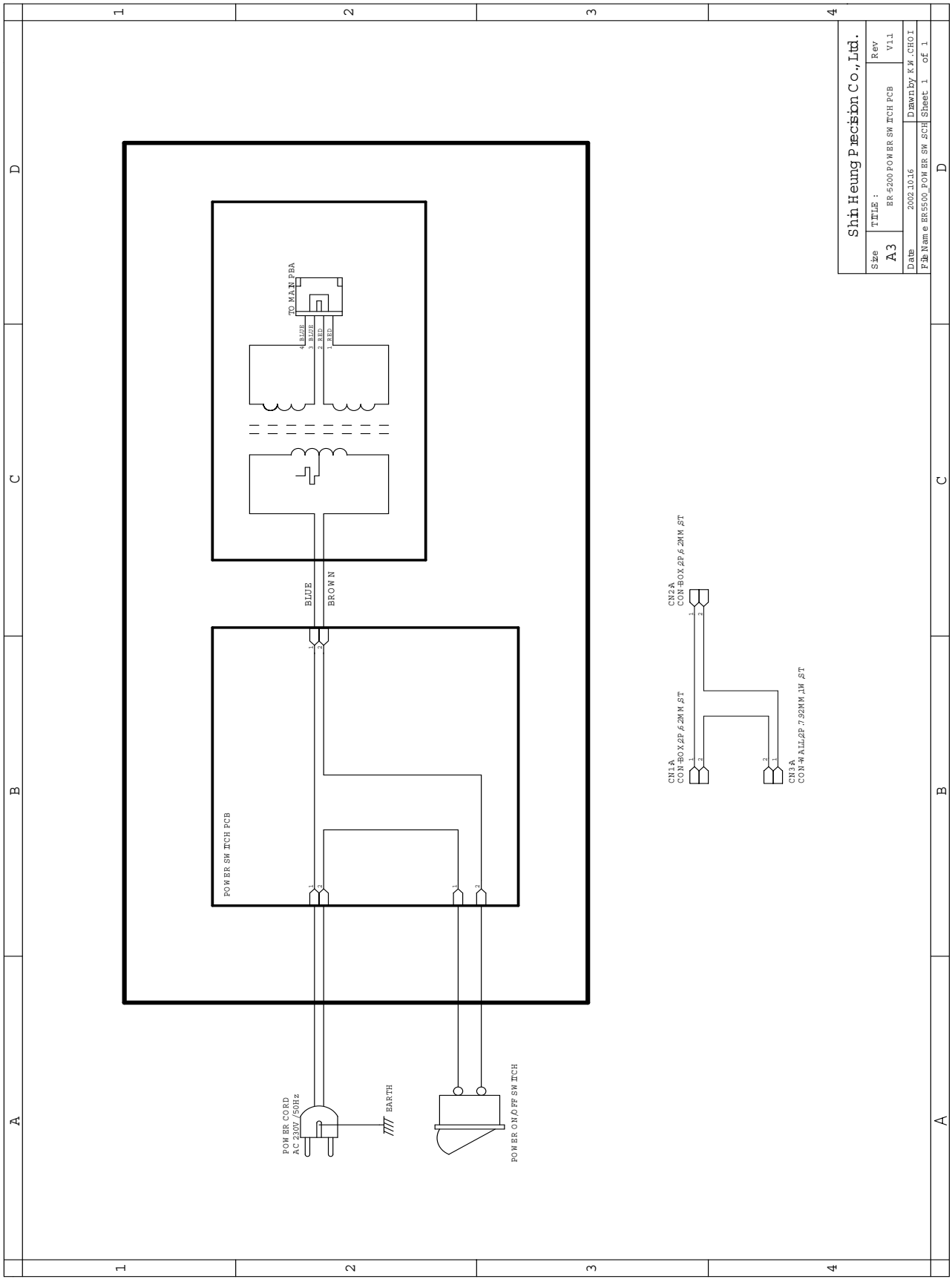

DUMMY CONNECTOR
CON-BOX;11P,2MM,ST
CN3:A
CN3:B
CN3:C
CN3:D
CN3:E
CN3:F
CN3:G
CN3:H
CN3:I
CN3:J
CN3:K
(BLUE)
CON-BOX;11P,2MM,ST
CN1:A
CN1:B
CN1:C
CN1:D
CN1:E
CN1:F
VSERIAL
TXD0
RXD0
DTR0
DSR0
GND
CON-DSUB;9P,FEMALE,ST
CN2:I
CN2:C
CN2:B
CN2:D
CN2:F
CN2:E
CN2:A
CN2:H
CN2:G
CON-DSUB;9P,FEMALE,ST
CN4:I
CN4:C
CN4:B
CN4:D
CN4:F
CN4:E
CN4:A
CN4:H
CN4:G
TXD1
RXD1
DTR1
DSR1
GND
I/F PCB
VCC
CON-BOX;5P,2.5MM,ST(YH)
CN9:1
CN9:2
CN9:3
CN9:4
CN9:5
TXD2_OUT
RXD2_IN
Shin Heung Precision Co., Ltd.
Size
A3
TITLE :
Rev
Date
Drawn by
File Name
Sheet
of
CON-BOX;22P,2MM,2R,ST
VSERIAL
TXD2_OUT
RXD2_IN
DTR2_OUT
DSR2_IN
TXD1_OUT
RXD1_IN
DTR1_OUT
DSR1_IN
TXD0_OUT
RXD0_IN
DTR0_OUT
DSR0_IN
C29
100nF
Q14
KSA708Y
Q15
KSA708Y
R32
1K
R31
4.7K
R35
1
1/2W
Q13
KSA1182-Y
Q12
MMBT2222A
R33
10K
R34
4.7K
VSERIAL_OFF
U1
MAX232
U2
MAX232
U3
MAX232
VCC
GND
C1+
V+
C1-
C2+
C2-
V-
T1OUT
R1IN
R1OUT
T1IN
T2OUT
R2IN
T2IN
R2OUT
C8
1uF
C23
1uF
C33
1uF
[UART#0]
[UART#1]
[UART#2]

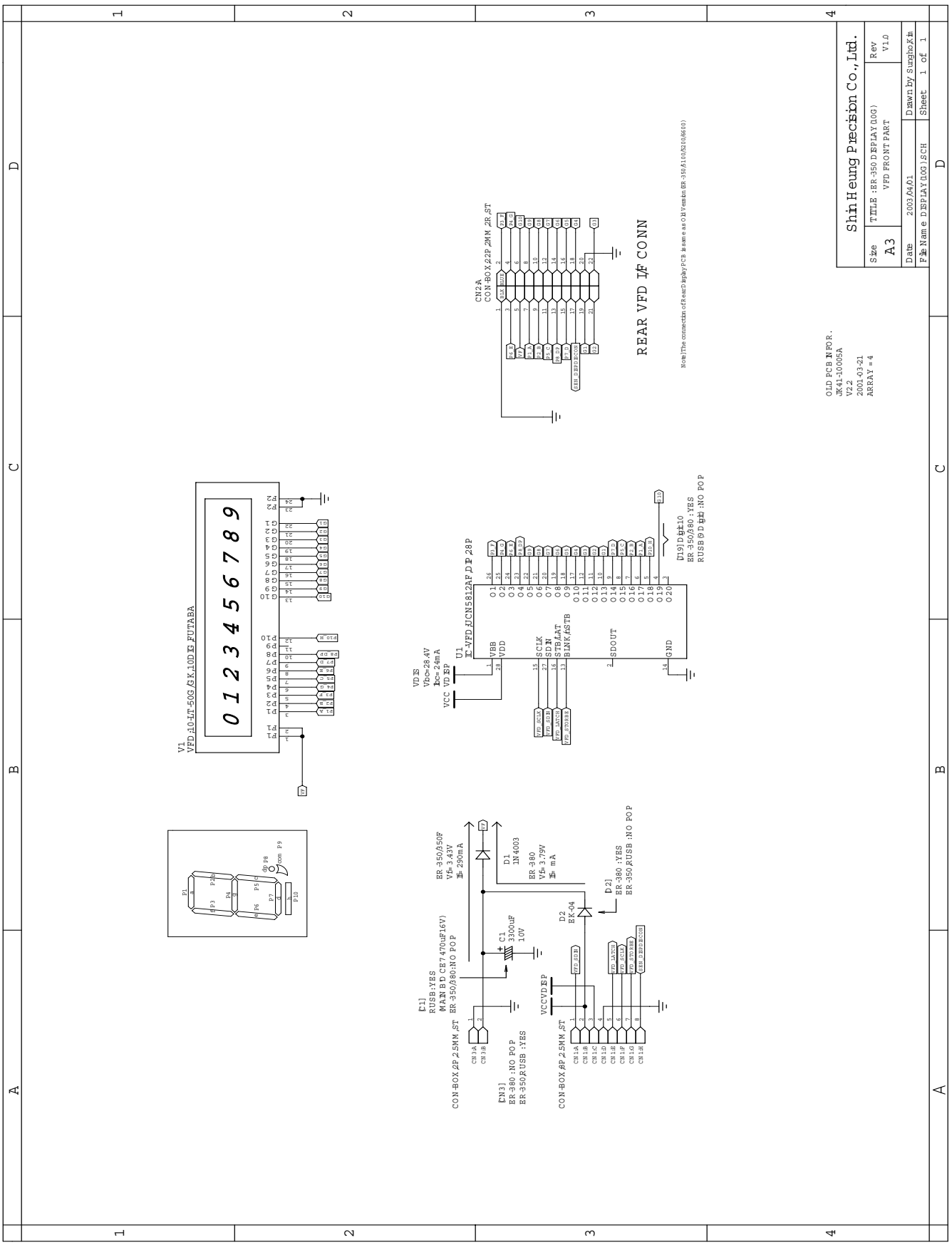

Shin Heung Precision Co., Ltd.
Size A3
TITLE : ER-380M MAIN
REVISION HISTORY
Rev V1.3
Date 2003.10.18
Drawn by K-Won Choi
File Name ER380_MAIN.SCH
Sheet 0 of 8
[Mode Key]
[Key Return]
[Key Scan]
CPU PORT 10.3 ; ADD (0x100000)
CON_BOX_8P_2.54MM_ST(TH)
CON-FPC_6P_2.54MM_ST
CON-FPC_8P_2.54MM_ST
74HCT541
74HC138
MMBD6050LT1
VCC
GND
0x100008~0X100000F

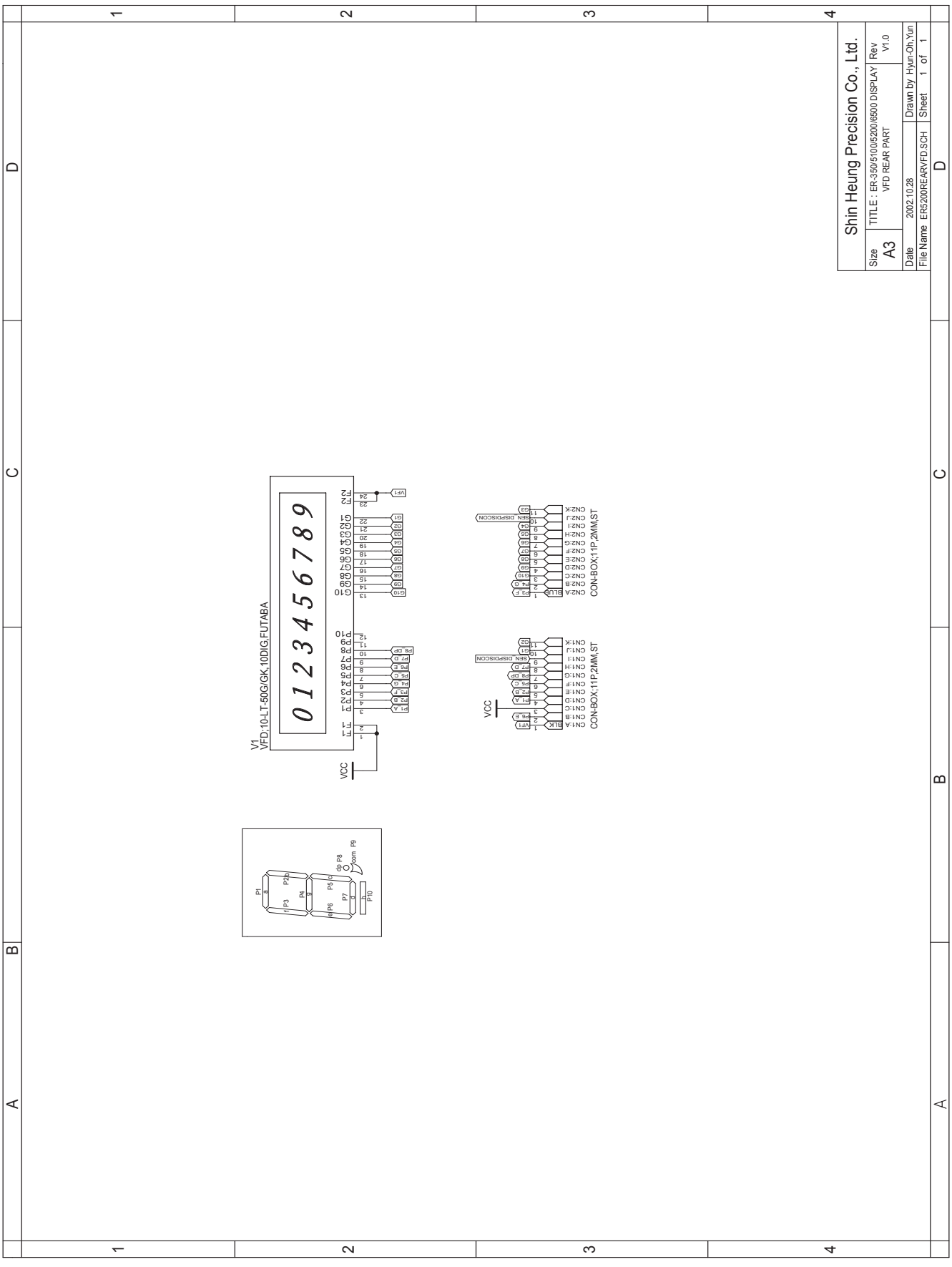

CPU Pin Signal
TPH_nSTB#1
TPH_nSTB#2
TPH Strobe Connect
TPH R-Side nSTB 1,2,3
TPH R-Side nSTB 4,5,6
Shin Heung Precision Co., Ltd.
Size A3
TITLE : ER-380M MAIN
REVISION HISTORY
Rev V1.4
Date 2003.10.18
File Name ER380 MAIN SCH
Drawn by K.W.on, Choi
Sheet 0 of 8
CN12-A
CON-FCC/JUP-2MM-2R-BT
VPH
VPH_VCC
PenHi1 Photo Diode
PenHi2 Photo Diode
R68 15K
R76 150K
R83 270
R80 270
R66 10K
R65 10K
TPH_THERM_RTN
TPH_nSTB#1
TPH_nSTB#2
TPH_PLATE1
TPH_PLATE2
TPH_PCLK
TPH_PDATA
MOT_A
MOT_/A
MOT_B
MOT_/B
SEN_LEVER_H
SEN_/RECH_H
SEN_FEED_H
R72 1K
R78 470
R87 150K
R82 56K
R85 150K
Q19 MMBT2222A
Q21 MMBT2222A
Q18 MMBT2222A
Q20 MMBT2222A
R95 10K
R79 10K
R81 10K
R94 10K
C80 100pF
C71 100pF
C56 100nF
74HC14
SEN_FEED
NOTE) U17/2 GATE is located in Page#1
U6 LB1838M
VCC
VPRT
VS1
VS2
ENA1
ENA2
IN1
IN2
GND1
GND2
VCONT
R56 10K
C44 100nF
C63 100nF
L8
L9
L10
L11
C60 100pF
C59 100pF
C55 100pF
C53 100pF
STEP_ENA
STEP_/ENA
STEP_ENB
STEP_/ENB
R84 10K
C76 100nF
SEN_/LEVER
R64 100
C69 100pF
R75 10K
SEN_/RECH

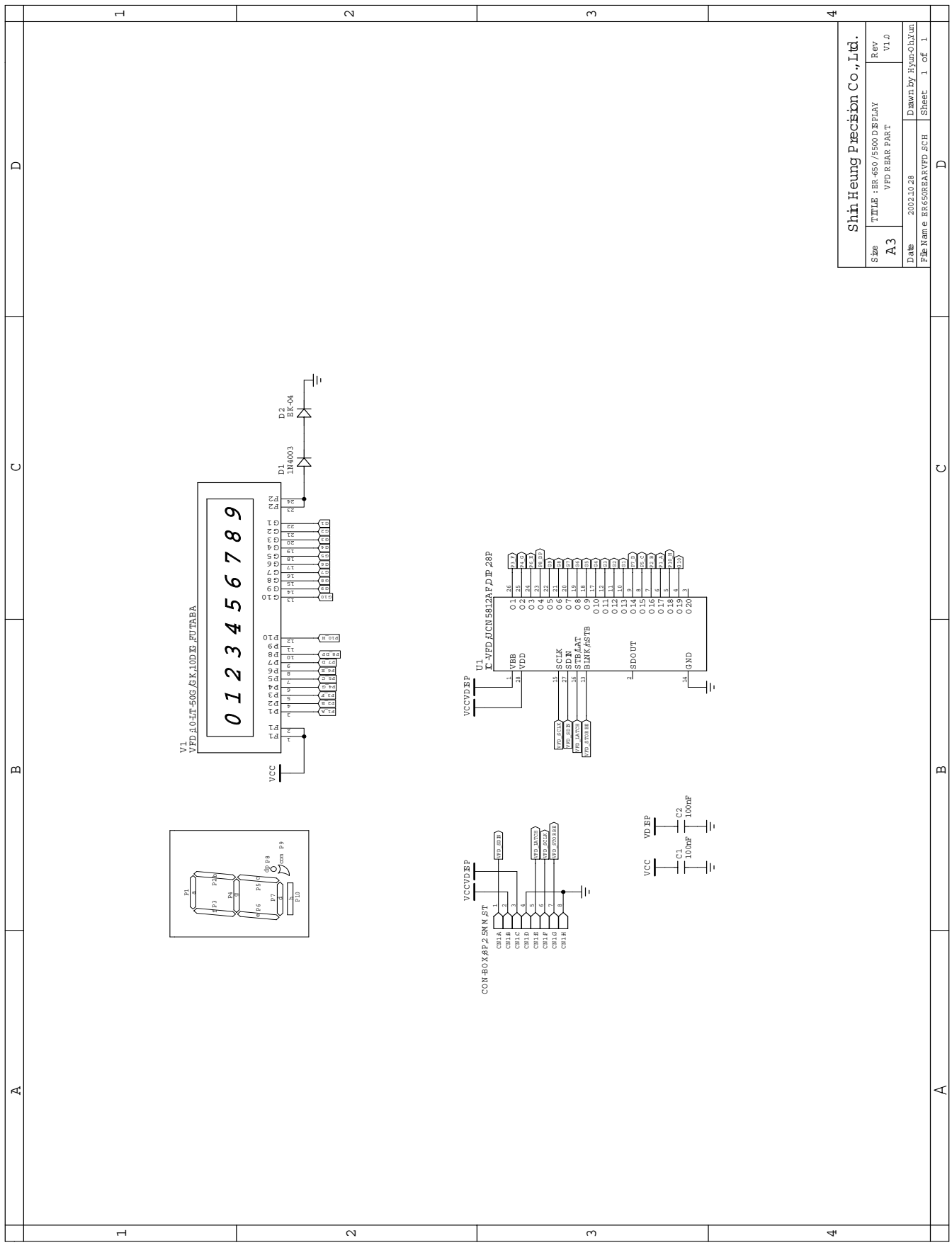

Shin Heung Precision Co., Ltd.
TITLE : ER-380M MAIN
REVISION HISTORY
Size A3
Rev V1.4
Date 2003.10.18
Drawn by K.W.on.Choi
File Name ER380_MAIN.SCH
Sheet 0 of 8
CON-BOX-30P-2MM-2R-ST
CN14
U18 KSC82C55
U22 MC7812
Q23 KSA1182-Y
Q24 MMBT2222A
Q25 MMBT2222A
D15 DIODE-SK14
D19 DIODE-SK14
ZD1 1N4735A
D17 MMBD6050LT1
C83 100uF 16V
C88 100nF
C90 100nF
C91 100nF
C94 100nF
C95 100nF
R102 4.7K
R107 6.8K
R108 4.7K
R117 1K
R118 470
R125 10K
R127 4.7K
R129 4.7K
VCC
VDRV
GND
RESET
0x200000~0x2FFFFF

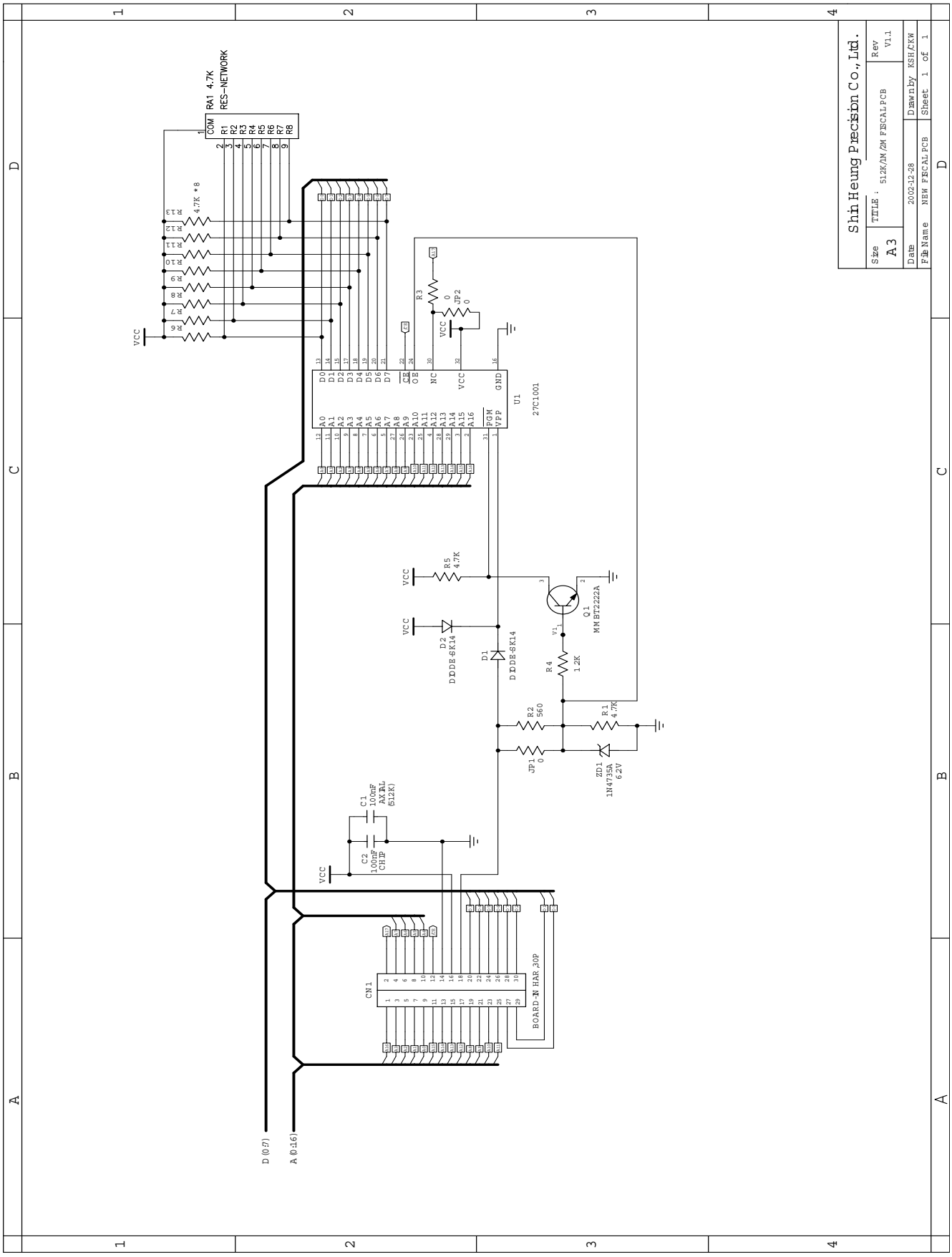

Shin Heung Precision Co., Ltd.
TITLE : ER-380M MAIN
REVISION HISTORY
Rev V1.4
Size A3
Date 2003.10.18
Drawn by K.W.Choi
File Name ER380_MAIN.SCH
Sheet 0 of 8
VO(V)= 1.25 x (1+ R2/R1)-1.25x (1/(27K/R_7K))+8.43 [V]
VDRV
VDSP
VPRT
VCC
FU1 250V/3.15A
C1 100nF FILM
BD1 BD_KBU6B
C5 4700uF 50V
C25 100nF
C27 100uF 50V
C40 100nF
R19 27K
R10 100
D4 M4
D5 M4
D6 M4
D7 M4
R14 27K
R12 4.7K
C34 470uF 16V
C3 100nF
L5 140uH
D3 1N5822
L6 FERRITE BEAD BFD3565R2
HS1 HEATSINK_S
Q10 KSA1010Y
Q6 KSA708Y
R16 560
R15 3.3K
R9 10K
R13 10K
R11 10K
C42 100pF
U4 MC34063A
DC SC
SBNSE SE
VCC TC
GND IN
R21 0.1
R20 0.1
R22 0.1
HS2 HEATSINK_S
U5 KC7805
IN OUT
GND
C50 100uF 16V
C7 470uF 50V
C4 2200uF 50V
LPP1 : 470uF,50V
LPP2 : 2200uF,50V
CN6A CN6B CN6C CN6D
PowerTransformerOutput
1&2 :AC24V
3&4 :AC30V
NOMSameasER6500,ER-650R


Shin Heung Precision Co., Ltd.
TITLE : ER-5200 POWER SWITCH PCB
Size A3
Rev V1.1
Date 2002.10.16
Drawn by K.W.CHOI
File Name ER5500_POWER SW.SCH
Sheet 1 of 1
TO MAIN PBA
4 BLUE
3 BLUE
2 RED
1 RED
BLUE
BROWN
POWER SWITCH PCB
CN1A
CONHOX2P6.2MM_ST
CN2A
CONBOX2P6.2MM_ST
CN3A
CONWALL2P7.92MM_1W_ST
POWER CORD
AC 230V/50Hz
EARTH
POWER ON/OFF SWITCH

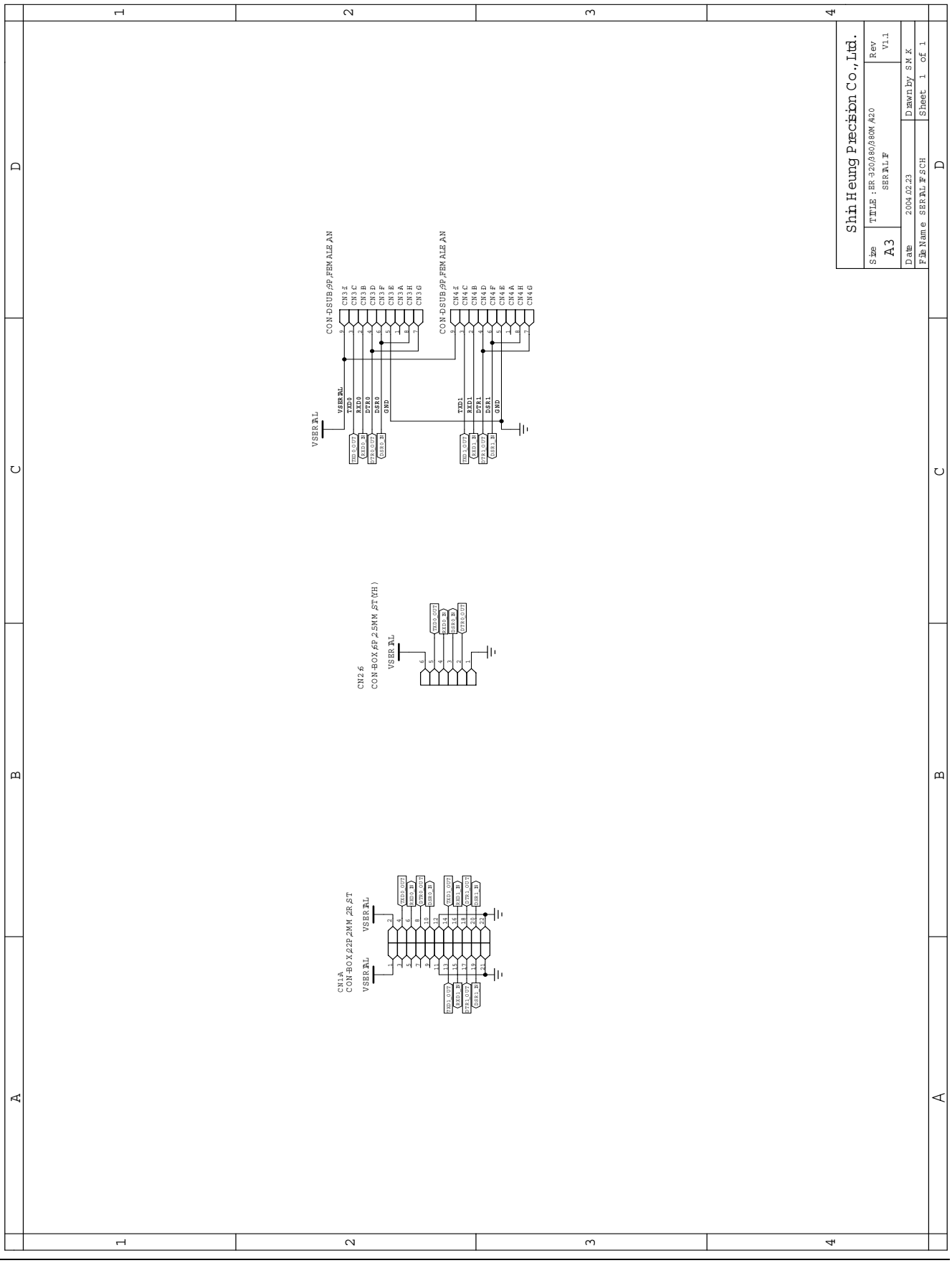

Shin Heung Precision Co., Ltd.
Size A3
TITLE : ER-350 DISPLAY(LOG)
VFD FRONT PART
Rev V1.0
Date 2003.04.01
Drawn by SunghoKim
File Name : DISPLAY(LOG).SCH
Sheet 1 of 1
REAR VFD I/F CONN
CN2A
CON-BOX.22P.2MM.ST.R
U1
IC-VFD.PCN5812AF.DIP.28P
V1
VFD.20-UT-560G/GK.10DIGIT.FUTABA
0 1 2 3 4 5 6 7 8 9
CN1
CON-BOX.2P.2.5MM.ST
CN3
CON-BOX.8P.2.5MM.ST
C1
MAIN BD CB 7.470uF(16V)
ER-350/380:NO POP
D1
1N4003
ER-380
D2
EK-04
ER-350/380:YES
ER-350/RUSB:NO POP
ER-380:NO POP
ER-350/RUSB:YES
OLD PCB INFOR.
JK41-10005A
V2.2
2001-03-21
ARRAY=4
Note)The connection of Rear Display PCB is same as OLD Version(ER-350/610/620/660/680)


Shin Heung Precision Co., Ltd.
Size A3
TITLE : ER-350/5100/5200/6500 DISPLAY
VFD REAR PART
Rev V1.0
Date 2002.10.28
Drawn by Hyun-Oh,Yun
File Name ER5200REARVFD.SCH
Sheet 1 of 1
V1
VFD;10-LT-50G/GK,10DIG,FUTABA
0 1 2 3 4 5 6 7 8 9
VCC
CON-BOX;11P,2MM,ST
CON-BOX;11P,2MM,ST
VCC
DISPDISCON
DISPDISCON


Shin Heung Precision Co., Ltd.
Size A3
TITLE : ER-650/5500 DISPLAY
VFD REAR PART
Rev V1.0
Date 2002.10.28
Drawn by Hyun-Oh,Yun
File Name ER650REARVFD.SCH
Sheet 1 of 1
V1
VFD 10-UT-50G/3K,10DIGITRON
0 1 2 3 4 5 6 7 8 9
VCC
D1
1N4003
D2
EK-04
U1
T-VFD,UCN5812AFP,28P
VBB
VDD
SCLK
SDIN
STBLAT
BLNK/STB
SDOUT
GND
VCCVDISP
VDISP
C1
100nF
C2
100nF
CON-BOX,8P2.5MM,ST
CN1.A
CN1.B
CN1.C
CN1.D
CN1.E
CN1.F
CN1.G
CN1.H


Shin Heung Precision Co., Ltd.
TITLE : 512K/1M/2M FSCALPCB
Rev V1.1
Size A3
Date 2002-12-28
Drawn by KSH/CKW
File Name NEW FSCALPCB
Sheet 1 of 1
RA1 4.7K
RES-NETWORK
COM R1 R2 R3 R4 R5 R6 R7 R8
R13 4.7K *8
R12 R11 R10 R9 R8 R7 R6
VCC
U1
27C1001
D0 D1 D2 D3 D4 D5 D6 D7
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16
CE OE NC VCC GND PGM VPP
R3 0
JP2 0
R5 4.7K
D2 DDDB6K14
D1 DDDB5K14
Q1 MMBT2222A
R4 1.2K
R2 560
R1 4.7K
JP1 0
ZD1 1N4735A 6.2V
C1 100nF AXIAL (512K)
C2 100nF CHIP
CN1
BOARD-TO-HARNESS
D(0:7)
A(0:16)

STB NO. | DOT NO. | DOTs/STB
1 | 1 ~ 64 | 64
2 | 65 ~ 128 | 64
3 | 129 ~ 192 | 64
4 | 193 ~ 256 | 64
5 | 257 ~ 320 | 64
6 | 321 ~ 384 | 64
TPH Pin Layout
FPC CABLE
FPC CONTACT POINT
TO TPH
[Feed Motor]
[Black Mark Sensor]
[Paper Near End Sensor]
[Paper End Sensor]
[Lever Sensor]
[Auto Cutter]
TO MAIN BOARD
Harness Connection
Shin Heung Precision Co., Ltd.
TITLE : STM-210 THERMAL PRINTER CONNECTION PBA
Size A3
Rev V1.1
Date 2002.07.10
Drawn by Hyun-Oh,Yun
File Name STM210_CONNECT.SCH
Sheet 1 of 1


Shin Heung Precision Co., Ltd.
Size A3
TITLE : SER-320/380/380M.A20
SERIAL.F
Rev V1.1
Date 2004.02.23
Drawn by S.M.K.
File Name SERIAL.F.SCH
Sheet 1 of 1
CON-DSUB/9P.FEMALE.AN
CN3.J
CN3.C
CN3.B
CN3.D
CN3.F
CN3.E
CN3.A
CN3.H
CN3.G
VSERIAL
TXD0
RXD0
DTR0
DSR0
GND
CON-DSUB/9P.FEMALE.AN
CN4.J
CN4.C
CN4.B
CN4.D
CN4.F
CN4.E
CN4.A
CN4.H
CN4.G
VSERIAL
TXD1
RXD1
DTR1
DSR1
GND
CN26
CON-BOX.6P.2.5MM.ST(YH)
VSERIAL
CN1A
CON-BOX.22P.2MM.2R.ST
VSERIAL
VSERIAL

MEMO

UPDATE LOG

Application Date	Page	Part #	Notes (Cause & Solution)	S/Bulletin

Use this page to record any special servicing information such as Service Bulletins or Supplements.
When possible, record changes to Code numbers directly on the actual Parts List. Always record Service Bulletin numbers and Application Dates on this log to ensure that your data is always as current as possible.

SAM4S

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V1.0

Code No. : JK68-60955A